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PROCEEDINGS

OF THE

Biological Society of Washington

VOLUME XII

1898

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1898

COMMITTEE ON PUBLICATIONS

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T. S. PALMER

F. H. KNOWLTON

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BIOLOGICAL SOCIETY OF WASHINGTON

For 1898

(ELECTED DECEMBER 18, 1897)

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VOL. XII, PP. VII-XII DECEMBER 30, 1898

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

PROCEEDINGS.

The Society meets in the Assembly Hall of the Cosmos Club on alternate Saturdays at 8 p. m. Brief notices of the meetings, with abstracts of communications, are published in *Science*.

January 7, 1898—Special Meeting.

The President, Dr. L. O. Howard, delivered the annual address at Columbian University on the topic, 'The Gypsy Moth in Massachusetts: A Great Experiment in Economic Entomology.'*

January 15, 1898—285th Meeting.

The President in the chair and 51 persons present.

C. Hart Merriam discussed a recently issued biography of Audubon.

The program for the evening consisted of a symposium on the topic, 'Recent Additions to our Knowledge of the Cell,' with the following speakers: Frank Baker, D. G. Fairchild, H. J. Webber, and W. T. Swingle. The communications were illustrated by diagrams and lantern slides.

January 29, 1898—286th Meeting.

The President in the chair and 24 persons present.

The following communications were presented:

William Palmer: The Birds of the Pribilof Islands.†

* Bull. No. 11, New Series, Division of Entomology, U. S. Dept. of Agriculture.

† 'Avifauna of the Pribilof Islands,' to be published as a chapter in the Report on the Fur Seal Islands, by David Starr Jordan, U. S. Treasury Department.

L. O. Howard: The European Hornet in America.

The remainder of the evening was occupied with an informal discussion on the classification of birds, F. A. Lucas, Theodore Gill, W. H. Ashmead, and William Palmer participating.

February 12, 1898—287th Meeting.

The President in the chair and 27 persons present.

L. O. Howard exhibited specimens of Mantidæ and Locustidæ collected by Dr. W. L. Abbott at Trong, Lower Siam, commenting particularly on the prevalence of aggressive resemblances among tropical Mantids.

The following communications were presented:

E. A. De Schweinitz: The Treatment of Animal Diseases with Antitoxic Serums.*

O. P. Hay: The Protospondyli and Aethiospondyli of A. S. Woodward.†

Theodore Gill: Classification of the Astacoidean Crustaceans.

February 26, 1898—288th Meeting.

The President in the chair and 57 persons present.

The evening was devoted to a symposium upon the topic, 'The Teaching of Biology,' with the following speakers: E. L. Morris, W. H. Dall, Erwin F. Smith, Theodore Gill, H. J. Webber, B. W. Evermann, Ch. Wardell Stiles, and Edward L. Greene.

March 12, 1898—289th Meeting.

The President in the chair and 26 persons present.

Theodore Gill exhibited and discussed a new text-book on zoology by Parker and Haswell.

M. B. Waite gave an illustration of fasciation in the black locust.

The following communications were presented:

Ch. Wardell Stiles: Practical Suggestions in Regard to Trichinosis.

Erwin F. Smith: Migula's 'System der Bakterien.'

F. C. Kenyon: Some Recent Advances in our Knowledge of the Nervous System.

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* To be published as a Report of the Bureau of Animal Industry.

† Am. Nat., XXXII, No. 377, pp. 341-349, May, 1898, under the title, 'Classification of the Amioid and Lepisosteoid Fishes.

March 26, 1898—290th Meeting.

The President in the chair and 45 persons present.

The evening was devoted to a symposium on 'The Comparative Value of Factors Influencing the Distribution of Life,' with the following speakers: C. Hart Merriam, L. O. Howard, W. H. Dall, F. V. Coville, Theodore Gill, B. E. Fernow, B. W. Evermann, and F. W. True.

April 9, 1898—291st Meeting.

Ex-President Theodore Gill in the chair and 28 persons present.

Vernon Bailey exhibited specimens of sticks cut by beavers, explaining the methods pursued by the animal in this operation.

The following communications were presented:

O. P. Hay: Observations on the Cretaceous Fishes called by Professor Cope '*Portheus*.'*

W. H. Osgood: Notes on the Natural History of the Farallon Islands. (Illustrated by lantern slides.)

William Palmer: A Phase of Feather Repigmentation.

April 23, 1898—292d Meeting.

Ex-President W. H. Dall in the chair and 65 persons present.

Charles L. Pollard exhibited the fruit of *Poinciana regia* and of *Cæsalpinia bonducella*, commenting on their occurrence in south Florida.

The following communications were presented:

C. Hart Merriam: Life Zone Conformities in the Distribution of Oregon Ground Squirrels.

Ernest Seton Thompson: The Personality of Some of Our Wild Animals. (Illustrated by lantern slides.)

May 7, 1898—293d Meeting.

Vice-President B. E. Fernow in the chair and 60 persons present.

The topic for the evening was 'The Fauna and Flora of the Florida Keys,' illustrated by lantern slides, the speakers being O. F. Cook, E. L. Morris, and Charles L. Pollard.†

* Zoological Bull., 2, No. 1, pp. 25-54, 1898.

† A portion of the topics discussed in this communication will form the basis for a report to be published in Contr. U. S. Nat. Herb.

May 24, 1898—294th Meeting.

The President in the chair and 20 persons present.

The following communications were presented:

F. C. Kenyon: Recent Experiments on the Nervous System of Arthropods, their Significance, and the Problems that Remain Unsolved.

Nathan Banks: The Scorpions of the Eastern United States.*

Gilbert H. Hicks: The Vitality of Seeds.

H. J. Webber: Researches on the Reproduction of Cycadaceous Plants.

October 22, 1898—295th Meeting.

The President in the chair and 37 persons present.

E. L. Morris commented on the frequency with which specimens of *Colocasia esculenta* in cultivation in Washington had bloomed during the past summer. He also cited a case of morning flowering in *Cereus grandiflorus*.

T. A. Williams noted the occurrence of a rare lichen, *Hydrothyria venosa*, at several localities in the West.

T. S. Palmer spoke of *Neomylodon*, an alleged living representative of a family of extinct edentates.

The following communications were presented:

J. N. Rose: Proposed Rearrangement of the Subfamily Agaveæ. (Illustrated by numerous living plants.) †

F. A. Lucas: The Fossil Bison of North America, with Description of a New Species. ‡

A. J. Pieters: Problems of Aquatic Vegetation. §

Gilbert H. Hicks: The Effect of Certain Fertilizers on the Germination of Seeds.

November 5, 1898—296th Meeting.

The President in the chair and 42 persons present.

F. V. Coville exhibited a piece of lava from Mt. St. Helens, bearing the impression of the bark of a pine.

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* To be published probably in Trans. Am. Ent. Soc.

† To be published in Contr. U. S. Nat. Herb.

‡ To be published in Proc. U. S. Nat. Mus.

§ To be published as a Bulletin of the Division of Botany, U. S. Dept. of Agriculture.

Albert F. Woods exhibited some leaves skeletonized by the small fresh-water crustacean *Cypridopsis.*

H. J. Webber noted the occurrence of seed production in some seedlings from a sport of *Clarkia pulchella.*

The following communications were presented:

D. G. Fairchild: The Dutch Botanical Gardens at Buitenzorg, Java. (Illustrated by numerous photographs.)

L. O. Howard: The Outbreak of the Fluted Scale in Portugal and Its Results.*

Chas. T. Simpson: The Destruction of the Pearly Fresh-water Mussels.†

F. A. Lucas: The Occurrence of Mammoth Remains on the Pribilof Islands.‡

November 19, 1898—297th Meeting.

The President in the chair and 31 persons present.

E. L. Morris gave an account of the ascent by a small snake of the polished nickel surface of a vertical stand-pipe.

F. W. True exhibited a copy of an entomological journal published in Japan, stating that it was probably the first journal of this nature issued in that country.

L. O. Howard exhibited posters prepared by the German government describing and figuring the Colorado potato beetle and the San José scale, and also one issued by the Russian government describing a destructive Russian grain beetle, *Anisoplia austriaca.*

The following communications were presented:

Cleveland Abbe: Climate and the Corn Crop.

H. J. Webber: A Comparison of Types of Fecundation of Flowering Plants.

December 3, 1898—298th Meeting.

The President in the chair and 40 persons present.

Upon invitation Professor A. D. Hopkins, of West Virginia, addressed the Society briefly, explaining a new method of illustrating specific and generic relationships by means of diagrams.

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* To be published as Bull. 18, New Series, Division of Entomology, Dept. of Agriculture.

† Substance embodied in a paper to be published by the U. S. Fish Commission.

‡ To be published in Science.

The following communications were presented:

Charles L. Pollard: Floral Asymmetry in *Chamæcrista.*

H. J. Webber: The Affinities of *Casuarina.*

O. F. Cook: Four Categories of Species.*

December 17, 1898—299th Meeting.

(NINETEENTH ANNUAL MEETING.)

The President in the chair and 32 persons present.

The annual reports of the Recording Secretary and Treasurer for the year 1898 were presented, and officers for the year 1899 were elected as follows:

President—Frederick V. Coville.

Vice-Presidents—Wm. H. Ashmead, Ch. Wardell Stiles, B. W. Evermann, F. A. Lucas.

Recording Secretary—H. J. Webber.

Corresponding Secretary—O. F. Cook.

Treasurer—F. H. Knowlton.

Additional Members of the Council—C. L. Marlatt, T. S. Palmer, Charles L. Pollard, F. W. True, M. B. Waite.

The following standing committees were appointed by the Chair:

On Communications—F. A. Lucas, chairman; Wm. H. Ashmead, L. H. Dewey, E. A. De Schweinitz, A. F. Woods.

On Publications—C. Hart Merriam, chairman; T. S. Palmer, F. H. Knowlton.

*To be published in the American Naturalist

VOL. XII, PP. 1-3 JANUARY 27, 1898

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

NOTES ON FISHES COLLECTED BY E. W. NELSON ON THE TRES MARIAS ISLANDS AND IN SINALOA AND JALISCO, MEXICO.

BY BARTON WARREN EVERMANN,

Ichthyologist, U. S. Fish Commission.

While engaged in collecting other objects of natural history in Mexico during the summer of 1897, Mr. Nelson obtained a few fishes, which were submitted to the writer for identification and report.

The collection contains four species, one of which proves to be new. The specimens were obtained at Rosario, Ixtapa, La Laguna de Juanacatlan and the Tres Marias Islands.

Rosario is situated about 80 miles southeast from Mazatlan and about 18 miles from the sea. The specimens from that place were obtained from freshwater pools left by the drying up of that portion of the Rosario River. The exact locality was about 15 miles above tide.

Ixtapa is in the State of Jalisco, on the Ixtapa River, about 12 miles above the head of the Bay of Banderas. The specimens from Maria Magdalena Island came from the interior about 250 feet above tide level, from a small stream which communicates with the sea during the rainy season. Those from Maria Cleofa came from a small freshwater stream close to the sea, but communicating with it only in wet weather. Maria Magdalena and Maria Cleofa islands are the two most southern of the Tres Marias group, situated about 60 miles off the coast of Jalisco. La Laguna de Juanacatlan is in the Sierra de Juanacatlan, in western Jalisco, at an altitude of 6,500 to 7,000 feet.

This collection, though small, is of interest, in that it increases our knowledge of the distribution of the species, and probably indicates a close relation between the freshwater fish fauna of the Tres Marias Islands and that of the adjacent mainland.

LIST OF SPECIES.

Family **Atherinidæ**. The Silversides.

1. *Chirostoma humboldtianum* (Cuvier & Velenciennes).

The collection contains 5 specimens of this species. They do not differ materially from specimens from the City of Mexico, the type locality.

Head $3\frac{1}{4}$ to $4\frac{1}{4}$ in length of fish; depth $4\frac{1}{5}$ to $5\frac{1}{2}$; eye $3\frac{3}{4}$ to $4\frac{1}{2}$ in head; snout 3 to $3\frac{1}{2}$. Dorsal IV–I, 10 to 12; Anal I, 16 to 19; scales 46, 13 to 15 in a transverse series.

Family **Mugilidæ**. The Mullets.

2. *Agonostomus nasutus* Günther.

The collection contains one specimen from Ixtapa, 3 from Maria Magdalena, and 2 from Maria Cleofa.

The specimen from the mainland agrees well with those from the islands.

The specimens are from $2\frac{3}{4}$ to $4\frac{1}{4}$ inches in length and present the following measurements: Head $3\frac{1}{2}$ to 4; depth $3\frac{3}{4}$ to 4; eye $3\frac{3}{4}$ to $4\frac{1}{2}$ in head; snout $3\frac{1}{3}$ to 4; interorbital width $2\frac{3}{4}$ to $3\frac{1}{5}$; maxillary $3\frac{1}{4}$ to $3\frac{1}{3}$. Dorsal IV–I, 8; Anal II, 9; scales 42 or 43, 11 in transverse series.

Type locality, Rio Geronimo, Central America.

Family **Cichlidæ**. The Cichlids.

3. *Heros beani* Jordan.

Eleven specimens of this common species obtained at Rosario, July 27, in the same pools from which the specimens of *Awaous nelsoni* were taken.

Head $2\frac{5}{6}$; depth $2\frac{1}{2}$; eye 4; snout $2\frac{8}{10}$. Dorsal XV, 11; Anal V, 7; scales 6–30–11; pores in lateral line 19 + 11.

Type locality, Mazatlan, Sinaloa.

Family **Gobiidæ**. The Gobies.

4. *Awaous nelsoni*, new species.

The collection contains 8 specimens of a goby which proves to be an undescribed species of *Awaous*.

Type locality, Rosario River, at Rosario, Sinaloa, Mexico. Collector, E. W. Nelson, July 27, 1897.

Type No. 48836, U. S. Nat. Mus. Cotypes Nos. 48837, U. S. Nat. Mus.; 533 U. S. Fish Comm.; and 5793, L. S. Jr. Univ. Mus. Collector's No. 839.

Awaous nelsoni Evermann.

Head $3\frac{1}{2}$; depth 6; eye $5\frac{3}{4}$ in head; snout 3; maxillary $2\frac{7}{8}$. D. VI–11; A. 11; scales about 63. Body long, compressed, and tapering posteriorly; head large, quadrate; mouth large, nearly horizontal, lower jaw included; snout abruptly decurved; top of head flat, the interorbital with a slight median groove with a thin, raised edge on each side; maxillary reaching about to vertical of anterior edge of pupil. Teeth in bands on jaws, very small, the outer somewhat enlarged. Pectoral rays normal, the longest $1\frac{1}{2}$ in head; ventrals completely united, the disk free from belly, $1\frac{3}{4}$ in head. Dorsal fins separated by a space about $\frac{2}{3}$ diameter of eye; dorsal spines slender, weak, about $1\frac{2}{3}$ in head; soft dorsal and anal similar, each free from caudal; caudal fin rather short and rounded, its middle rays about $1\frac{1}{4}$ in head. Inner edge of shoulder girdle with 3 dermal papillæ; gill-membranes broadly united to the isthmus; eye moderate, high up, the interorbital width equal to the eye's diameter. Scales ctenoid, very small, and irregularly crowded anteriorly, much larger posteriorly, about 15 rows counting from origin of soft dorsal downward and backward to the anal fin; head naked, but with slight indication of a few minute embedded scales on opercles. Color grayish; head mottled and blotched with dark; side with 7 or 8 black blotches, the largest under middle of pectoral fin; dorsals pale, crossed by several lines of black spots; caudal pale, with about 6 or 7 dark cross-bars; ventrals and anal pale; pectorals pale, dusted with dark specks and with a small dark blotch at base of upper rays. Length, 4 inches.

The 7 specimens taken as cotypes do not show any considerable variations from the type. The more important variations are indicated in the following description: Head $3\frac{2}{5}$ to $3\frac{3}{5}$; depth 5 to $6\frac{1}{2}$; eye 5 to 6 in head; snout $2\frac{3}{5}$ to 3. D. VI–11; A. 10 or 11; scales 60 to 70.

The number of scales seems to be the most unstable character, but this is partly due to the difficulty of counting them accurately. They are so crowded and irregularly arranged anteriorly as to make definite counting impossible.

Awaous nelsoni seems most closely related to *A. taiasica* (Lichtenstein), from which it differs in the larger scales on posterior part of body, the broader interorbital, the longer snout, and the darker coloration.

I take pleasure in naming this interesting species for Mr. Edward William Nelson, the well-known ornithologist, in recognition of his early work upon the fishes of Illinois, in 1874–'5.

VOL. XII. PP. 5-11 JANUARY 27, 1898

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

BIOLOGICAL LIBRARY

DESCRIPTIONS OF NEW BIRDS FROM THE TRES MARIAS ISLANDS, WESTERN MEXICO.

BY E. W. NELSON.

The specimens upon which the present paper is based were obtained by myself and my assistant, Mr. E. A. Goldman, on the Tres Marias Islands, off the west coast of Mexico, during May, 1897. Our visit there was a continuation of the work carried on in Mexico by the Biological Survey of the Department of Agriculture.

Special efforts were made to secure series of the resident land birds, in which we were quite successful. The study of these series, in connection with our collection from the adjacent mainland during the same season, indicates that most of the resident land birds of the islands, not already described, differ in a more or less marked degree from their nearest mainland relatives. In most cases the island birds cannot be considered more than geographical races, although a few differ sufficiently to be treated as species. Not a single species has been found on the islands which has not a closely related form on the mainland. The bird fauna as a whole will be treated in detail in a paper now in course of preparation.

Previous work on the Tres Marias may be briefly summarized as follows: In 1865–1867 the group was visited three times by Colonel A. J. Grayson, who made extensive collections of birds for the Smithsonian Institution. From these collections a number of new species and subspecies have been described at various times by Baird, Cassin, Lawrence, and Ridgway. In addition, Von

Madarasz has described a *Vireo* from a collection made there in 1881 by Mr. A. Forrer. Mr. Xantus is supposed to have visited the islands during his stay on the west coast of Mexico, but we have no definite information in regard to his trip.

I am indebted to Dr. C. Hart Merriam, Chief of the Biological Survey, for the opportunity to prepare the present paper. My thanks are due also to Mr. Robert Ridgway, Curator, and Dr. Chas. W. Richmond, Assistant Curator, of Birds in the U. S. National Museum, for continued favors during the progress of my work on Mexican birds.

All of the birds described below, except the Magdalena Wren, which seemed to be restricted to Magdalena Island, were taken on Maria Madre Island, and probably occur on the other islands also.

All measurements are in millimeters.

Columba flavirostris madrensis subsp. nov. Tres Marias Pigeon.

Type No. 156698, U. S. Nat. Mus., Biological Survey Coll., ♂ ad., Maria Madre Island, Mexico, May 13, 1897. Collected by E. W. Nelson and E. A. Goldman.

Description.—Differs from typical *C. flavirostris* in somewhat larger size; decidedly larger and longer bill and generally paler colors; lower border of greater wing coverts broadly margined with white as in *Columba gymnophthalma*. Dimensions of type: wing, 209; tail, 138; culmen, 17; tarsus, 26.

Average measurements of *Columba flavirostris.*—♂ (4 specimens): wing, 195.5; tail, 123.5; culmen, 13.7; tarsus, 24.7. ♀ (3 specimens): wing, 193; tail, 120.6; culmen, 14.1; tarsus, 25.3.

Average measurements of *C. flavirostris madrensis.*—♂ (4 specimens): wing, 202.7; tail, 129; culmen, 15.7; tarsus, 27.1. ♀ (3 specimens): wing, 201; tail, 127; culmen, 16.6; tarsus, 26.3.

A single specimen from the islands lacks the white margins on the greater wing coverts, but has all the other characters of the insular race, such as the large bill and pale colors. This is the only one among a dozen or more specimens examined which lacked this marking. The mainland yellow-billed pigeon not infrequently has a narrow margin of white on the borders of the greater coverts, but I have never seen one in which this character is so striking as on the ordinary island birds.

Leptotila capitalis subsp. nov. Tres Marias Dove.

Type No. 156709, U. S. Nat. Mus., Biological Survey Coll., ad. ♂, Maria Madre Island, Mexico, May 6, 1897. Collected by E. W. Nelson and E. A. Goldman.

Description of type.—Forehead, and crown to line between middle of

orbits, pale creamy drab, shading abruptly into the purplish iridescence which overlies remainder of crown and back of neck. This purplish iridescence on the neck ends abruptly just in front of shoulders, and is bordered by a narrow band of feathers tipped with greenish iridescence. Entire dorsal surface, including wings and middle pair of tail feathers, brown with an olive wash, except on tail and upper tail coverts. Throat distinctly whitish; remainder of lower side of neck and thence back over chest delicate creamy lilac; abdomen and under tail coverts white with a pale wash of buffy brown on edges of some of the feathers. Flanks dull buffy brown; tail feathers, except middle pair, blackish tipped with white—this tipping broadest on outer pair of feathers; under wing coverts and axillars pale cinnamon. Dimensions of type: wing, 152; tail, 109; culmen, 18.5; tarsus, 33.

Averages of *Leptotila fulvirentris brachyptera*.—♂ (5 specimens): wing, 147.8; tail, 108.8; culmen, 16; tarsus, 31.3. ♀ (3 specimens): wing, 144 3; tail, 104.6; culmen, 15.6; tarsus, 30.6.

Averages of *L. capitalis*.—♂ (5 specimens): wing, 152.5; tail, 110.6; culmen, 17.9; tarsus, 32 2. ♀ (3 specimens): wing, 151.6; tail, 107; culmen, 18.8; tarsus, 30.6.

This species can be distinguished at once from its nearest mainland relatives, *P. fulvirentris* and *P. fulvirentris brachyptera*, by its paler colors and larger bill. Stragglers of typical *brachyptera* occur on the islands, as shown by a specimen obtained there by Col. Grayson, now in the National Museum. This specimen is identical with the mainland bird and shows no sign of approach to the insular species.

Buteo borealis fumosus subsp. nov. Tres Marias Red-tailed Hawk.

Type No. 156714, U. S. Nat. Mus., Biological Survey Coll., ad. ♂, Maria Madre Island, Mexico, May 6, 1897. Collected by E. W. Nelson and E. A. Goldman.

Description.—Entire head and neck nearly uniform smoky brown, with scarcely a trace of lighter markings on throat or chin. Back and wings blackish brown; breast and remainder of lower surface, except neck, heavily marked with dull rusty, smoky brown, and dull whitish or buffy; no sign of lighter area on breast; the markings on ventral surface are in the form of indistinct barrings which are most clearly defined on the tibia. Dimensions of type: wing, 375; tail, 206; culmen, 26; tarsus, 81.

Averages of *Buteo b. socorroensis*.—♂ (2 specimens): wing, 387.5; tail, 207.5; culmen, 25; tarsus, 80. ♀ (1 specimen): wing, 425; tail, 221; culmen, 30; tarsus, 86.

Averages of *B. borealis fumosus*.—♂ (3 specimens): wing, 373.3; tail, 207.3; culmen, 26; tarsus, 81.3. ♀ (1 specimen): wing, 412; tail, 214; culmen, 30; tarsus, 84.

The Tres Marias form is darker and more uniformly marked below, and lacks the lighter areas on throat and breast that are found in *B. borealis socorroensis*. On the dorsal surface *fumosus* is readily distinguishable from *socorroensis* by the uniformly smoky brown head and neck, the

rusty edgings to the neck and wing feathers of the latter bird being entirely absent. Curiously enough, although the Tres Marias Islands are only about one-fifth as far from the coast as Socorro Island, yet the Tres Marias race is more distinct from *B. borealis calurus* than is *socorroensis*.

Polyborus cheriway pallidus subsp. nov. Tres Marias Caracara.

Type No. 156715, U. S. Nat. Mus., Biological Survey Coll., ♂ ad., Maria Madre Island, Mexico, May 3, 1897. Collected by E. W. Nelson and E. A. Goldman.

Description.—General pattern of coloration as in *P. cheriway*, but much paler or lighter brown. The darkest adult from the islands is somewhat paler than the palest adult from the mainland in the considerable series I have examined. The same proportionately paler colors prevail on immature birds from the islands. The terminal black band on the tail of the island bird averages narrower, and the other dark bars on the tail are fainter. The light and dark markings on back at base of neck are in the form of regular bars instead of being broken into a roughly wavy pattern by the oval form of the black areas on the feathers, as in specimens of *cheriway* from the mainland of Mexico. The wing, tail, and tarsus average shorter than in *cheriway* of the Mexican mainland, bill about the same. Dimensions of type: wing, 370; tail, 198; culmen, 32; tarsus, 86.

Averages of *Polyborus cheriway* (from mainland of Mexico).—♂ (4 specimens): wing, 392; tail, 208.7; culmen, 32.5; tarsus, 90.7. ♀ (2 specimens): wing, 396.5; tail, 217.5; culmen, 33.5; tarsus, 89.

Averages of *P. cheriway pallidus*.—♂ (4 specimens): wing, 370.7; tail, 194; culmen, 32; tarsus, 86.5. ♀ (4 specimens): wing, 386.5; tail, 205; culmen, 32.7; tarsus, 88.

A specimen from the mainland adjacent to the Tres Marias group approximates the island form, and a series might prove the birds from that district to be intermediate.

Trogon ambiguus goldmani subsp. nov. Goldman's Trogon.

Type No. 156752, U. S. Nat. Mus., Biological Survey Coll., ad. ♂, Maria Madre Island, Mexico, May 10, 1897. Collected by E. W. Nelson and E. A. Goldman.

Description.—Males decidedly greener above than typical *ambiguus*, with very little of the coppery iridescence characteristic of the latter. Females and young differ still more, their backs being decidedly ashy and having much paler rufous on middle tail feathers; exposed parts of scapulars, tertiaries, and wing coverts gray, mottled with fine, wavy, black lines, with slight indication of the brown which forms the main color of these feathers in *ambiguus* proper; colors of lower parts decidedly paler. In size the two forms differ but little. Dimensions of type: wing, 128; tail, 148; culmen, 20; tarsus, 17.

Averages of *Trogon ambiguus*.—♂ (4 specimens): wing, 131; tail, 161.2; culmen, 19.5; tarsus, 16.7. ♀ (1 specimen): wing, 127; tail, 170; culmen, 18.5; tarsus, 17.

Averages of *T. ambiguus goldmani*.—♂ (4 specimens): wing, 130.7; tail, 153.2; culmen, 19.7; tarsus, 17. ♀ (1 specimen): wing, 134; tail, 167; culmen, 19; tarsus, 18.

Nyctidromus albicollis insularis subsp. nov. Tres Marias Parauque.

Type No. 156765, U. S. Nat. Mus., Biological Survey Coll., ad. ♂, Maria Madre Island, Mexico, May 10, 1897. Collected by E. W. Nelson and E. A. Goldman.

Description.—The island birds can be distinguished from *N. albicollis*, of the adjacent mainland, by uniformly duller, more grayish brown colors of entire dorsal surface and broader transverse dark bars on lower surface, especially on abdomen and flanks. The culmen and tarsus are relatively shorter and wings and tail longer. Dimensions of type: wing, 173; tail, 169; culmen, 11; tarsus, 26.

Averages of *Nyctidromus albicollis* (from mainland of Mexico).—♂ (5 specimens): wing, 158.4; tail, 146.6; culmen, 11.2; tarsus, 26.5. ♀ (5 specimens): wing, 152.6; tail, 136; culmen, 11; tarsus, 25.9.

Averages of *N. albicollis insularis*.—♂ (5 specimens): wing, 170.6; tail, 162.4; culmen, 10.9; tarsus, 25.9. ♀ (5 specimens): wing, 168.4; tail, 154.4; culmen, 11.6; tarsus, 25.8.

A notable feature of *insularis*, shown in the series before me, is its remarkable constancy of coloration compared with the amount of variation in the large number of mainland specimens examined. The latter show a wide range of color from grayish to rufous. A single specimen in the island series has a slight rufous shading, but agrees with the others in size. In the mainland series a specimen from Ixtapa, Jalisco, is colored like *insularis*, but agrees with other birds from the same region in its smaller size.

Myiopagis placens minimus subsp. nov. Little Green Flycatcher.

Type No. 156817, U. S. Nat. Mus., Biological Survey Coll., ad. ♂, Maria Madre Island, Mexico, May 10, 1897. Collected by E. W. Nelson and E. A. Goldman.

Description.—Similar to *M. placens*, but grayer, especially about head and neck; top of head and neck lighter than rest of dorsal surface instead of darker, as in the mainland form. The island form averages smaller than true *placens*. Dimensions of type: wing, 64.5; tail, 66; culmen, 12; tarsus, 19.5.

Averages of *Myiopagis placens*.—♂ and ♀ (8 specimens): wing, 68.2; tail, 65.8; culmen, 11.2; tarsus, 19.1.

Averages of *M. placens minimus*.—♂ (5 specimens): wing, 64.9; tail, 64.8; culmen, 11.8; tarsus, 19.4. ♀ (5 specimens): wing, 65.5; tail, 63; culmen, 11.6; tarsus, 19.2.

In the National Museum is a typical specimen of *placens* taken on the Tres Marias by Col. Grayson, showing that it occurs there as a straggler.

Cardinalis cardinalis mariæ subsp. nov. Tres Maria Cardinal.

Type No. 156907, U. S. Nat. Mus., Biological Survey Coll., ad. ♂, Maria Madre Island, Mexico, May 3, 1897. Collected by E. W. Nelson and E. A. Goldman.

Description.—Males most like those of *C. cardinalis igneus*, but red of under parts deeper and richer, lacking the pinkish suffusion notable in *igneus;* color of back also richer, and feathers less edged with gray.

The females of the two forms are more distinct than the males. *C. mariæ* has a large whitish throat area, and the entire abdomen is whitish, thus confining the main buffy area of lower parts to a broad pectoral band. The bill is more swollen; the wing is longer and tail shorter than in *igneus*. Dimensions of type: wing, 101; tail, 103; culmen, 20; tarsus, 29.

Averages of *Cardinalis c. igneus.*—♂ (4 specimens): wing, 94.5; tail, 106; culmen, 20; tarsus, 26.6. ♀ (3 specimens): wing, 91.6; tail, 104.3; culmen, 20; tarsus, 26.8.

Averages of *C. c. mariæ.*—♂ (4 specimens): wing, 97.7; tail, 98.7; culmen, 20.5; tarsus, 28.9. ♀ (4 specimens): wing, 91.7; tail, 89.7; culmen, 19.9; tarsus, 28.2.

Vireo hypochryseus sordidus subsp. nov. Tres Marias Vireo.

Type No. 156898, U. S. Nat. Mus., Biological Survey Coll., ad. ♂, Maria Madre Island, Mexico, May 13, 1897. Collected by E. W. Nelson and E. A. Goldman.

Description.—Differs from *V. hypochryseus* in duller, more olive green on dorsal surface, and dingier, more greenish yellow under parts. The bill is darker horn color and larger than in true *hypochryseus*. Dimensions of type: wing, 66; tail, 61; culmen, 13; tarsus, 21.

Averages of *Vireo hypochryseus.*—♂ (5 specimens): wing, 63.4; tail, 57.8; culmen, 12.4; tarsus, 19.5. ♀ (2 specimens): wing, 63; tail, 55.5; culmen, 12; tarsus, 20.

Averages of *V. hypochryseus sordidus.*—♂ (7 specimens): wing, 67.3; tail, 60.3; culmen, 13.3; tarsus, 21. ♀ (3 specimens): wing, 66.3; tail, 60.7; culmen, 12.7; tarsus, 21.1.

Melanotis cærulescens longirostris subsp. nov. Tres Marias Blue Mockingbird.

Type No. 156923, U. S. Nat. Mus., Biological Survey Coll., ad ♂, Maria Madre Island, Mexico, May 4, 1897. Collected by E. W. Nelson and E. A. Goldman.

Description of type.—General color dull slaty blue with a grayish cast; top of head and all of neck and breast paler than rest of body; remainder of lower parts dull grayish blue (becoming smoky bluish in some specimens); back, rump, scapulars, and wing coverts dull slaty blue. Two central tail feathers and outer web of other rectrices same as back; rest

of tail dull black; lores, ear coverts, and fore part of chin black. Dimensions of type: wing, 101; tail, 104; culmen, 29; tarsus, 32.

Averages of *Melanotis cærulescens.*—♂ (4 specimens): wing, 115.5; tail, 125.5; culmen, 24.9; tarsus, 31.2. ♀ (1 specimen): wing, 106; tail, 111; culmen, 24.5; tarsus, 29.

Averages of *M. cærulescens longirostris.*—♂ (3 specimens): wing, 104.6; tail, 105; culmen, 29; tarsus, 30.6. ♀ (1 specimen): wing, 108; tail, 102; culmen, 29; tarsus, 32.

The grayer colors, smaller size, and larger bill are the main points distinguishing this form from typical *cærulescens.*

Thryothorus lawrencii magdalenæ subsp. nov. Magdalena Island Wren.

Type No. 156943, U. S. Nat. Mus., Biological Survey Coll., ad. ♂, Magdalena Island, Mexico, May 28, 1897. Collected by E. W. Nelson and E. A. Goldman.

Description of type.—Back warm umber brown with a slight grayish wash; top of head and neck deeper, purer rufescent than back; rump and upper tail coverts lighter, brighter rufescent than back; wings and middle tail feathers rufous brown; tail irregularly barred with blackish brown and whitish, the latter color more or less heavily shaded with dull rufous brown; a distinct white supra-loral stripe from base of bill to nape; sides of head and neck indistinctly marked with blackish lines; chin, throat, breast, and middle of abdomen white; sides of breast and flanks reddish brown; under tail coverts whitish with a shaft line and spot (or bar) of blackish brown near tips. Dimensions of type: wing, 55; tail, 55; culmen, 16.5; tarsus, 21.

Average of 3 adult males of *Thryothorus lawrencii.*—Wing, 60; tail, 55.6; culmen, 17.2; tarsus, 22.

This form combines certain characters of typical *T. felix* with those of *T. lawrencii.* The rufous on the crown and nape is even deeper than in typical *felix*, while the white lower parts are as in true *lawrencii.*

Compared with a specimen of *felix* from Ometepec, Guerrero, believed to be typical, *magdalenæ* has a pure white area covering most of lower parts in place of the rich rufous of *felix.* The rufous of the flanks is paler; under tail coverts less barred; crown and rump nearly the same shade of rufous; back a little grayer; sides of head much less heavily streaked with black.

From *lawrencii* it may be distinguished by its much richer colored or more rufous upper parts, by somewhat heavier dark streaking on the side of the head and neck, and by the richer wash of rufous on the flanks.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

MAMMALS OF TRES MARIAS ISLANDS, OFF WESTERN MEXICO.

BY C. HART MERRIAM.

Mr. E. W. Nelson spent the month of May, 1897, on the Tres Marias Islands in the interest of the Biological Survey of the U. S. Department of Agriculture. This visit has resulted in a large increase in knowledge of the fauna and flora of the islands. The new birds are described by Mr. Nelson in a preceding brochure of the present volume; the new mammals are named in the present paper.

In the Mammal volume of the 'Biologia Centrali-Americana' it is stated that according to Mr. Forrer, a collector who visited the islands in 1881, only three indigenous land mammals, besides bats, occur there. These are a rabbit, a raccoon, and a pigmy opossum. Mr. Nelson obtained all of these and two additional genera, a rat (*Oryzomys*) and a white-footed mouse (*Peromyscus*), and these in spite of Mr. Forrer's statement that "the inhabitants know of no rats or mice whatever in the islands, except, of course, the cosmopolitan *Mus decumanus*" (p. 212). The introduced rat brought back by Mr. Nelson is not the common or Norway rat (*Mus decumanus*), but the Roof rat or gray phase of the Black rat (*Mus rattus*).

Mr. Nelson and his assistant, Mr. E. A. Goldman, collected 146 specimens of mammals, representing nine species, of which the introduced rat is one, three are bats, and five are indigenous terrestrial land mammals. Of the latter, the rabbit is peculiar to the islands, and was described by Allen in 1877; the remaining four I have compared critically with the most closely related

species from the mainland, and find that they differ in such pronounced characters that I am forced to describe them as distinct. One of the bats also is here described as new.

The raccoon was recorded in 'Biologia' as the South American *Procyon cancrivorus*, but with a series of eight specimens before me I am unable to detect any characters by which it can be referred to that species. Its affinities, on the other hand, are distinctly with *P. lotor* and *P. lotor hernandezi*, of which it appears to be merely a pale form, possessing slight though constant cranial differences. In view of these facts, I have described it as a new subspecies of *lotor*. Those who insist on intergradation as the touchstone of subspecies will have to set it up as a full species.

The alleged occurrence of *P. cancrivorus* on the Tres Marias is cited in 'Biologia' "as furnishing another instance of the peculiar affinity of their fauna to that of Southern Central America" (p. 209). Mr. Nelson's collections, however, show that not only the raccoon and all the other mammals, but also the birds, reptiles, and plants, are closely related to species now living on the adjacent mainland of Mexico.

One of the bats obtained by Mr. Forrer is recorded by Mr. Thomas as a young specimen of *Chœronycteris mexicanus*. Inasmuch as this species was not obtained by Mr. Nelson, whereas the commonest bat of the island, a *Glossophaga*, was not recorded from Forrer's collection, and since the two genera are closely related, is it not possible that a reëxamination of the Forrer specimen will show it to be a *Glossophaga* instead of a *Chœronycteris?* Assuming this to be the case, 10 indigenous land mammals are known from the islands. Of these, five, or exactly half, are bats; of the others, one is a Marsupial; one a Carnivore, and three are Rodents.

Of marine mammals three are recorded, a seal and two porpoises, but since only one of these was obtained, the identification of the other two is uncertain.

Marmosa insularis sp. nov. Tres Marias Pigmy Opossum.

Type from Maria Madre Island Mexico. No. 89215 ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected May 16, 1897, by E. W. Nelson and E. A. Goldman. Original No. 11028.

Characters.—Size and general appearance as in *M. canescens*, but ears larger, tail longer, fore feet smaller, color more fulvous, skull longer and more slender.

Color.—Upper parts drab brown suffused with pale dull fulvous, purest and strongest on sides of neck; black rings around eyes broader, and reaching farther forward on sides of nose, than in *M. canescens;* median facial stripe buffy fulvous, narrower and more sharply defined than in *canescens;* under parts buffy yellow, deepest on throat and breast. In the 4 specimens examined there is no white on the tail; *canescens* commonly has the terminal part white.

Cranial characters.—Skull similar to that of *canescens* but longer, decidedly narrower and more slender; brain case more rounded; rostrum, palate, and base of skull between audital bullæ conspicuously narrower.

Measurements.—Type specimen: Total length 270; tail vertebræ 167; hind foot 19.5. Average of 3 males from type locality: Total length 285; tail vertebræ 170; hind foot 20.

Remarks.—Five specimens of this pretty little opossum were obtained on Maria Madre Island and present practically no individual variation. Mr. Nelson states that the species was common in the forest on top of the ridge which extends along the middle of Maria Madre Island.

Oryzomys nelsoni sp. nov. Nelson's Rice Rat.

Type from Maria Madre Island, Tres Marias Islands, Mexico. No. 89200 ♂ ad., U. S. Nat. Mus., Biological Survey Collection. Collected May 13, 1897, by E. W. Nelson and E. A. Goldman. Original No. 11022.

Characters.—Size large (decidedly larger than *O. mexicanus*); tail exceedingly long and nearly naked; ears medium, scant haired and rather pale; color yellowish fulvous; skull large and massive.

Color.—Upper parts dull yellowish fulvous, slightly darkened on head and back by blackish hairs, becoming pale buffy ochraceous on flanks and thighs; underparts white, the plumbeous underfur showing through in places; tail dark except on proximal ⅓ or ½ of under side which is pale yellowish; hind feet scantily haired with whitish hairs.

Cranial and dental characters.—Skull very large and massive, increasing in length (but not in breadth) with age; interparietal very broad anteroposteriorly. Contrasted with *O. mexicanus* Allen, the skull is very much larger and heavier (even the ♀ being much larger than the ♂ of *mexicanus*); the rostrum decidedly larger; the interparietal broader anteroposteriorly, and the molar teeth relatively as well as actually much broader.

Measurements.—Type specimen, ♂ ad.: Total length 342; tail vertebræ 190; hind foot 38. An adult ♀: Total length 320; tail vertebræ 185; hind foot 37. Average of 2 adult males from type locality: Total length 343; tail vertebræ 190.5; hind foot 38.5.

Remarks.—Mr. Nelson found this new species living in damp thickets and about springs near the summit of Maria Madre Island, where four specimens were obtained.

Peromyscus madrensis sp. nov. Tres Marias Mouse.

Type from Maria Madre Id., Tres Marias Islands, Mexico. No. 89223 ♂ ad. U. S. Nat. Mus., Biological Survey Coll. Collected May 18, 1897, by E. W. Nelson and E. A. Goldman. Orig. No. 11040.

Characters.—Size rather large; tail long and scant haired; ears medium; color dull pale fulvous; skull without superciliary ridges. In general, similar to *P. spicilegus* Allen, but much larger, with longer tail and shorter ears.

Color.—Upper parts pale dull fulvous (almost ochraceous buff) with an indistinct darker dorsal band on posterior half of back; under parts, lips and feet white; a salmon or fulvous pectoral spot or streak usually present; a dark spot on upper side of ankle; eyelids dark; ears essentially same color as body; tail dark above and at tip all round; whitish below.

Cranial characters.—Skull rather flat and smoothly rounded; rostrum elongate; no supraorbital ridges. Compared with *P. spicilegus*, its nearest known ally from the mainland of Mexico, the skull of *P. madrensis* is larger, the brain case decidedly broader and flatter; the molar series of teeth actually of the same length (relatively shorter) and somewhat broader.

Measurements.—Type specimen: Total length 222; tail vertebræ 119; hind foot 26. Average of 12 specimens from type locality: Total length 224; tail vertebræ 120; hind foot 26.

Remarks—This mouse, according to Mr. Nelson's notes, is the most common rodent on the islands. He says: "Specimens were taken on all three islands. They were generally distributed in the forest above the shore belt which is infested by land crabs, and were found more commonly about the fig trees on the high interior ridge of Maria Madre than elsewhere." Specimens from Cleofa Id. are larger than those from Maria Madre Id. (average of 3: total length 229.5; tail vertebræ 120; hind foot 27.8) and have larger and heavier skulls. Two specimens from Magdalena Id. have a pale saffron-yellow wash on the belly, probably due to staining.

Mus rattus Linn. Introduced Rat.

Mr. Nelson states that this introduced rat, of which he brought back two specimens, was found in small numbers over most parts of Maria Madre Id., where it lives in the forest like the native mice.

Lepus graysoni Allen. Tres Marias Cottontail.

Lepus graysoni Allen, Monog. N. Am. Rodentia, 347–348, 1877. Type from Tres Marias Ids., Mexico.

Mr. Nelson obtained 16 specimens of this very desirable rabbit. He states that the species occurs abundantly on the two larger islands, Maria Madre and Magdalena, and the small San Juanito, and is reported to occur on Maria Cleofa Island also.

Procyon lotor insularis subsp. nov. Tres Marias Raccoon.

Type from Maria Madre Island, Tres Marias Ids., Mexico. No. 88978 ♂ old, U. S. Nat. Mus., Biological Survey Coll. Collected May 10, 1897, by E. W. Nelson and E. A. Goldman. Orig. No. 10985.

Characters.—Similar to *P. lotor* and *hernandezi* but smaller and paler; ears smaller and only slightly marked at base; top of head grayer.

Cranial characters.—Skull in general similar to those of *P. lotor* and *hernandezi* but relatively shorter; frontals at and behind plane of postorbital processes broader; squamosal arm of zygomatic arch more expanded vertically; mastoid processes decidedly shorter and thicker; pterygoids squarely truncate anteriorly and of even breadth throughout (as seen from below), instead of tapering anteriorly to a thin point or scale as in both *lotor* and *hernandezi;* audital bullæ slightly smaller than in *hernandezi*, decidedly smaller and less inflated than in *lotor*.

Dental characters.—Premolars somewhat larger and more crowded than in *lotor;* upper carnassial as in *lotor*—smaller than in *hernandezi;* first upper molar about the same size as in *lotor* and similar in form, smaller than in *hernandezi* and much less quadrate.

Measurements.—Type specimen ♂ ad.: Total length 854; tail vertebræ 286; hind foot 132. An adult ♀: Total length 735; tail vertebræ 232; hind foot 126. Average of 5 adult males from type locality: Total length 841; tail vertebræ 287; hind foot 131.

Remarks.—Mr. Nelson found the Raccoon common on the two larger islands, Maria Madre and Maria Magdalena, but saw no signs of them on Maria Cleofa although told that they occur there sparingly.

? **Zalophus californianus** (Lesson). Sea-Lion.

In the absence of positive knowledge as to the identity of the Tres Marias seal, it is referred provisionally to the above species. It is of course possible that the Guadalupe fur-seal (*Arctocephalus townsendi*) may occur here also.

Mr. Nelson's notes contain the following: "A large seal or sea-lion, called *lobo marino* or sea wolf by the Mexicans, was reported to occur at several places on the rocky shores of Maria Magdalena and Maria Cleofa Islands. We heard of them first before leaving San Blas and again when we reached the islands. From the accounts received it was evident that they had been hunted for sport by various visitors until they had become comparatively scarce. We made careful inquiries, and, after learning of the location of the places most frequented by them on both islands, visited these places under the guidance of a tortoise-shell hunter who was very familiar with the shore. Only a single seal was seen; it was on a rocky islet off the shore of Maria Cleofa, and took to the water and disappeared before we could get a shot. Our guide informed me that at times the seals disappear from the islands for a few days, and this may account for our failure to find them in their usual haunts. The consensus of opinion among the residents of Maria Madre Island was that these animals are now very scarce. Formerly they were found at many places,

but at present a rocky point on the northwest side, and a jutting reef on the south side of Maria Magdalena Island, and some islets off the west shore of Maria Cleofa, are the landing places used by the remnants of the considerable number that once lived here. They are doubtless doomed to speedy extinction."

Rhogeëssa parvula H. Allen. Tres Marias Rhogeëssa.

Rhogeëssa parvula H. Allen, Proc. Acad. Nat. Sci. Phila., 285, 1866. Type from Tres Marias Ids., Mexico.

A single badly mutilated specimen of this little known bat was shot on Maria Madre Id., where, according to Mr. Nelson's notes, it is "not uncommon in the forest."

Myotis nigricans (Maximilian). Maximilian's Black Bat.

Mr. Thomas states that "a specimen of this species was obtained by Mr. Forrer in the Tres Marias Islands." (Biologia Centrali-Americana, Mammalia, 206. 1881.)

Otopterus mexicanus (Saussure). Big-eared Bat.

Macrotus mexicanus Saussure, Rev. et Mag. de Zool., 2e sér. XII, 486–487, 1860. Type from Yautepec, Morelos, Mexico.

This large long-eared bat is very common on Maria Madre Id., where Mr. Nelson collected 52 specimens. He found it in the daytime in two or three caves, and also in an old unused warehouse. The females were heavy with young at the time of his visit (May, 1897). I have compared Mr. Nelson's Tres Marias specimens with specimens collected by him near the type locality of Saussure's '*Macrotus mexicanus*' in the State of Morelos, Mexico, and find no tangible differences except that the ears of the island specimens are slightly the larger. I have also compared both series with a fine series of topotypes of *Otopterus bulleri* (H. Allen) from Bolaños, Jalisco, and am unable to find any characters on which the latter form can stand.

Glossophaga mutica sp. nov. Tres Marias Glossophaga.

Type from Maria Madre Id., Tres Marias Ids., Mexico. No. 89271 ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected May 8, 1897, by E. W. Nelson and E. A. Goldman. Orig. No. 10976.

Characters.—Similar to *G. soricina* (Pallas) and *G. truei* H. Allen, but differing in proportions and color—reddish brown instead of gray or sooty.

Color.—Fur of upper parts with basal ¾ dull white; apical ¼ dull cinnamon brown; underparts similar but much paler.

Cranial and dental characters.—In the absence of authentic skulls of *G. soricina* and *truei* for comparison it is impossible to differentiate the cranial characters of *G. mutica*. The rostrum is rather broad, flat, and swollen; a rounded protuberance over each orbit marks the junction of the rostrum with the braincase; the braincase is abruptly elevated and

strongly inflated and arched; the basisphenoid is strongly keeled along the median line and its posterior fourth is abruptly elevated and has a pocket or fossa on each side between the audital bullæ, and on the same plane with the basioccipital; the zygomatic arches are slender, nearly parallel, rods; the upper canines divaricate so strongly that they are conspicuous when the skull is viewed from above; the premolars are narrow and well spaced; the molars are small and weak.

Measurements of type specimen, ♂ ad.: Total length (in flesh) 65 mm.; tail vertebræ (in flesh) 8; [following measurements from dry skin] forearm 35.5; metacarpal of 3d (longest) digit 35.5; tibia 14; ear from anterior basal angle 9; tragus from outer base 4.5.

Remarks.—Mr. Nelson obtained 37 specimens of this new *Glossophaga* on Maria Madre Id., where he found it inhabiting caves. Many of the females contained partly developed embryos.

Chœronycteris mexicana Tschudi. Tschudi's Bat.

Chœronycteris mexicana Tschudi, Fauna Peruana, I, 72–73, 1844. Type from Mexico.

"An immature specimen of this somewhat rare species is contained in Mr. Forrer's Tres Marias collection."—(Mr. Thomas in Biologia Centrali-Americana, 207, 1881). As already suggested, it would be worth while to reëxamine this specimen with reference to the possibility of its being *Glossophaga mutica.*

Lasiurus borealis mexicana (Sauss.). Mexican Red Bat.

Atalapha mexicana Saussure, Rev. et Mag. de Zool., 2e sér. XIII, 91, March, 1861. Type from Mexico.

This species was not obtained by Mr. Nelson, but is recorded by Thomas (under the old name *Atalapha frantzii*) as collected by Forrer on the Tres Marias. (Biologia, Mammalia, 205, 1881.)

? Phocæna communis Lesson. Common Porpoise.

Mr. Nelson states that "a porpoise, supposed to be this species, was common around the shores of the Tres Marias Islands, and also in bays and at the mouths of streams or lagoons along the coast of the mainland. They were always seen in the belt of shallow discolored water within a short distance of shore. As soon as the blue water was reached, with a depth of over 40 fathoms, the other species, *Prodelphinus longirostris*, was encountered. The present species was seen in schools of from ten to thirty or forty individuals swimming in loose order. At Maria Madre they came into the bay and close along shore early in the morning."

Prodelphinus longirostris (Gray). Long-nosed Porpoise.

Mr. Goldman shot a porpoise 12 to 15 miles off the islands, which Mr. F. W. True has kindly identified as *Prodelphinus longirostris* (Gray). Mr. Nelson states that there were probably 200 in the school from which this specimen was secured, and that a number of such schools were seen between San Blas and the islands.

Vol. XII, pp. 21-22 January 27, 1898

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW SPECIES OF EVOTOMYS FROM BRITISH COLUMBIA.

BY VERNON BAILEY.

Since the publication of my revision of the genus *Evotomys* in the Proceedings of the Biological Society last May,* a large series of specimens has been collected in the Pacific Coast region from northern California northward into British Columbia. The known ranges of several species have been considerably extended, and one form, inhabiting the low coast country of southern British Columbia, proves to be undescribed. It seems to be entirely distinct from neighboring species and worthy of full specific rank. In external characters it most nearly resembles *E. wrangeli*, but in cranial characters shows the opposite extreme of development in the short, wide skull. With its geographically nearest neighbors, *E. occidentalis* and *E. saturatus*, on the south, it shows no close affinities, being distinguished from them at a glance by its very short tail and smaller size.

Evotomys caurinus sp. nov.

Type from Lund, east shore of Malaspina Inlet, British Columbia. No. 89460, ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected July 18, 1897, by Edward A. Preble. Original No. 2147.

Geographic distribution.—The coast region of British Columbia east of the Strait of Georgia and south to the Frazer River.

General characters.—Size rather small; colors dark; tail very short; skull short and wide, with narrow rostrum and rather small audital bullæ.

Color.—In *summer:* dorsal area well defined, dark, rich chestnut dark-

* Proc. Biol. Soc. Wash., XI, 113-138, May 13, 1897.

ened with black tipped hairs; sides sepia gray tinged with pale buff; spots over side glands of males whitish or dusky; face clear dark gray; belly washed with whitish or rarely buffy; ears dusky, scantily haired; tail bicolor, chestnut or dusky above with blackish tip, buffy below; feet soiled whitish or slightly dusky. In *winter:* dorsal area brighter, more rufescent than in summer; sides clearer gray. *Young:* darker than adults, with dusky bellies, feet and tails.

Cranial characters.—Skull short and wide with spreading zygomata and very narrow nasals and rostrum; nasals truncate posteriorly and terminating even with ends of premaxillæ; audital bullæ small and flattened compared with those of *occidentalis* or *saturatus*, about equal to those of *wrangeli* but wider and flatter; incisors small and slender; molars small and crowded longitudinally; anterior loop of second and third upper molars usually indented; middle pair of triangles usually confluent in each lower molar.

Measurements of type specimen.—(Measured in flesh by E. A. Preble): total length, 135; tail vertebræ, 34; hind foot, 18. Average of 5 adults from type locality: total length, 135; tail vertebræ, 36; hind foot, 18. *Skull* of type: basal length, 21; nasals, 6.2; zygomatic breadth, 13.3; mastoid breadth, 10.8; alveolar length of upper molar series, 4.9.

Remarks.—The type series of 10 specimens shows only summer pelage and young; a specimen taken at Agassiz, B. C., Dec. 6, is in nearly full winter pelage.

VOL. XII, PP. 23-26 JANUARY 27, 1898

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTION OF A NEW DEER (*DORCELAPHUS TEXANUS*) FROM TEXAS AND NORTHERN MEXICO.

BY EDGAR A. MEARNS.

The small white-tailed deer of Texas differs so materially in size, proportions, coloration, and cranial characters from the other members of the *Dorcelaphus americanus** group as to necessitate its separation. It may be known by the following description:

Dorcelaphus texanus new species. Texan Deer.

Type from Fort Clark, Kinney County, Texas. No. 4288, author's collection.† Adult male. Collected December 25, 1897, by Dr. Edgar A. Mearns.

General characters.—Size small; ears relatively small, with black on edges and tip; horns small and strongly incurved; limbs relatively short; molar and premolar teeth very large; general color pale; coat fine and long.

* In the Proceedings of the Biological Society of Washington, vol. X, February, 1896, page 25, Mr. Outram Bangs reverted to the specific name *americanus* with the following remark: "The name *Cervus virginianus* Boddaert is so well known and has stood for our eastern deer so long that it seems like sacrilege to change it, but it is antedated by seven years by Erxleben's name *Cervus dama americana*. Erxleben proposed this name on page 312 of his Syst. Regni Animalis, Mammalia, 1777. In a separate paragraph at the end of his article on *Cervus dama* he asks if *americanus* is different, as supposed by Pennant (Differtne vere *americanus* vti Pennanto videtur?). He quotes a part of Pennant's description and gives synonomy, so that the name will have to stand. He gives its distribution as Virginia and Carolina."

† The type and other specimens collected will be placed, as soon as possible, in the collection of the U. S. National Museum, at Washington, D. C.

Color.—In the type, which is in complete winter coat, the upper surface is superficially a pepper-and-salt mixture of black, yellowish white, and gray. A distinctly blackish area begins anteriorly on the crown, between the horns and ears, and extends posteriorly almost to the root of the tail. The color gradually pales to light yellowish ash on the sides. All of the hairs of the upper surface are white at extreme base, plumbeous ash in the middle, black apically, and subterminally ringed with yellowish white, these whitish annuli increasing in width from the vertebral area downwards. Under surface pure white on the axillæ, inner surface of thighs, and abdomen; fuliginous on the chest. Tail white below, black above, the black of the upper surface much obscured by broad yellowish brown subterminal annuli to the hairs. Head, with naked nose-pad, and front of under lip, plumbeous-black. Iris yellowish hazel. Upper jaw white anteriorly, next to the naked muffle, becoming light ash further back, with an intervening area of black, which latter forms a triangular area, with its base applied to the posterior margin of the nostril and its apex crossing the middle of the upper lip and extending over the under jaw to form a small black spot behind the pure white chin. Throat white, mixed with ash where the basal coloring of the hair is exposed, between the white tips. Upper side of head black, much obscured on the forehead by dirty white and reddish subterminal annuli. Orbits and base of ear externally whitish. Concavity of ear densely clothed with long white hair; convexity tipped and bordered by black, except at base anteriorly, the black enclosing an area of pepper-and-salt gray; base of ear posteriorly clear ash-gray. Sides of head ash-gray, thickly annulated with whitish. Brows and bristles about eyes all black; those about muzzle black and white. Limbs reddish fawn, more or less mixed with gray and black anteriorly, whitish or pale fawn color posteriorly, and white around hoofs and between toes. Hoofs plumbeous, horn color where worn off at apex. The metatarsal gland, which measures 15 mm. in length, is surrounded by a tuft of reversed hair, which is white in the middle, bordered by dark brown.

A young male, an old female, and a young female (Nos. 4289, 4290, and 4291, author's collection) killed with the type December 25, 1897, and also in full winter pelage, agree essentially in coloration with the adult male described above, except that the ears and crown of head are blacker, and the light annulations on the upper side of the tail nearly or quite wanting, leaving that part clear black.

The summer coat, as usual, is reddish.

Horns.—The horns of the type approach those of the Sonoran deer, *Dorcelaphus couesi* (Coues and Yarrow), in size and form. There are two basal snags, one directed upward and backward (length 75 mm.), and one forward (length 37 mm.), with four additional points to each horn, making twelve points in all. The length of the beam, measured to end of anterior point, following the curves of the horn, is 440 mm. The horns are symmetrical, their longest points measuring 175 mm. in height. The beam is strongly curved upward, forward, and inward, the tips of the anterior tines

approaching within 70 mm. of each other. The total expanse of the horns is 330 mm.; the circumference of beam, at base, 80 mm.

Measurements of type.—Length, measured from end of muzzle to end of last caudal vertebra, 1585 mm.; tail vertebræ, 265 (to end of hairs 345); ear from crown, 160; ear from base of opening, 140; girth of chest, 800; from tip of nose to angle of mouth, 90; to eye, 152; to center of pupil, 170; to base of ear, 225; to base of horn, 220; to occiput, 280; diameter of eye, 26; fore limb, from coracoid process of scapula to end of hoof, 700; from olecranon, 575; length of manus, 325; hind limb, from knee-joint to end of hoof, 625; length of pes, 430; height of animal at shoulder, 880; height at hips, 900; from great trochanter to coracoid, 710.

Cranial and dental characters.—The skull is narrow, with elongate nasals. That of the type, an old male in which the permanent premolars are considerably worn, presents the following measurements: basilar length (basion to front of premaxillary), 244 mm.; zygomatic breadth (across middle of orbits), 114; occipito-nasal length, 208; least interorbital breadth, 71; greatest length of nasals, 81; greatest breadth of nasals, 31; least breadth of nasals, 18.5; greatest diameter of orbit, 38; length of upper lateral tooth-row, 24. The skull of an old female (No. 4290, author's collection) presents these dimensions: basilar length, 241 mm.; zygomatic breadth, 96; greatest length of nasals, 81; greatest breadth of nasals, 26; greatest diameter of orbit, 35. In the type specimen the nasal and premaxillary bones are separated by a space of 10 mm., which is occupied by a forward arm of the maxillary. In a young male (No. 4289, author's collection), having three points and a basal snag to each horn, the nasal and premaxillary bones barely meet. In an old female (No. 4290, author's collection) and a yearling female (No. 4291, author's collection), the premaxillaries articulate broadly with the nasals.

Remarks.—Numerous skins of this deer from Texas, and Mexico south to San Luis Potosi, have been examined and found to agree in size and coloration with those above described. The horns vary within ordinary limits; but those of the type represent the usual size and form, except that there is more often but one basal snag. The bucks weigh in the neighborhood of 100 pounds, and the does about 75 pounds.

While the Texan deer differs sufficiently from the white-tailed deer of southern Mexico and Central America, as well as from the forms recognized in the United States, to warrant its separation, the available material is insufficient to furnish a reliable indication as to its intergradation with them. Therefore, for the present, it is proper to regard it as a species.

Comparisons.—The type locality of *Dorcelaphus americanus* (Erxleben) was given as Virginia and Carolina. Compared with specimens from that general region, *D. texanus* is found to differ in being much smaller and paler, with actually as well as relatively heavier dentition. Between the ranges of these two, a very different form is interposed in the lowlands of Louisiana.

The Floridan deer, *Dorcelaphus osceola* (Bangs) is even darker in color than *D. americanus*. Compared with the present form, it is larger, with

relatively longer limbs, larger horns, smaller teeth, and more elongate rostrum.

Dorcelaphus macrourus (Rafinesque) is a large pallid form of the northern plains region, characterized by restriction of the dark, and corresponding expansion of the light areas. It has widely branching, often scraggy horns, very different from those of *D. texanus*.

The only remaining deer of the United States requiring comparison with the small Texan species is the Sonoran deer, *Dorcelaphus couesi* (Coues and Yarrow), a still smaller and more pallid animal, having much larger ears, on which the black edging and tips were wanting. The dentition of *D. texanus* is much heavier, and the tail considerably shorter, than in *D. couesi*.

The only Mexican deer with which the present form requires comparison is the animal that has been known by the specific name *mexicanus*. This name was first applied by Gmelin.* According to Dr J. A. Allen,† "the *Cervus mexicanus* of Gmelin, however, is a vague composite species, only in part referable to Deer from Mexico, and in all probability has no relation to the little Sonoran Deer described by Baird."‡ The name *mexicanus* may, however, be regarded as fixed to a deer of southern Mexico, very different from the Texan deer, by Lichtenstein, who described and figured the species § from specimens sent alive to Berlin, in 1825, by Herr Graf, from 'Mexico,' without indication of the exact locality at which they were taken.

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*Syst. Nat., I, 1788, p. 179.

† Bull. Am. Mus. Nat. Hist., VII, June 29, 1895, p. 200.

‡ Rept. Pacific R. R. Expl. and Surveys, VIII, Mammals, 1857, pp. 653–655, pl. XXIV, fig. 2.

§ Darstellung, 1827–'34, pl. XVIII.

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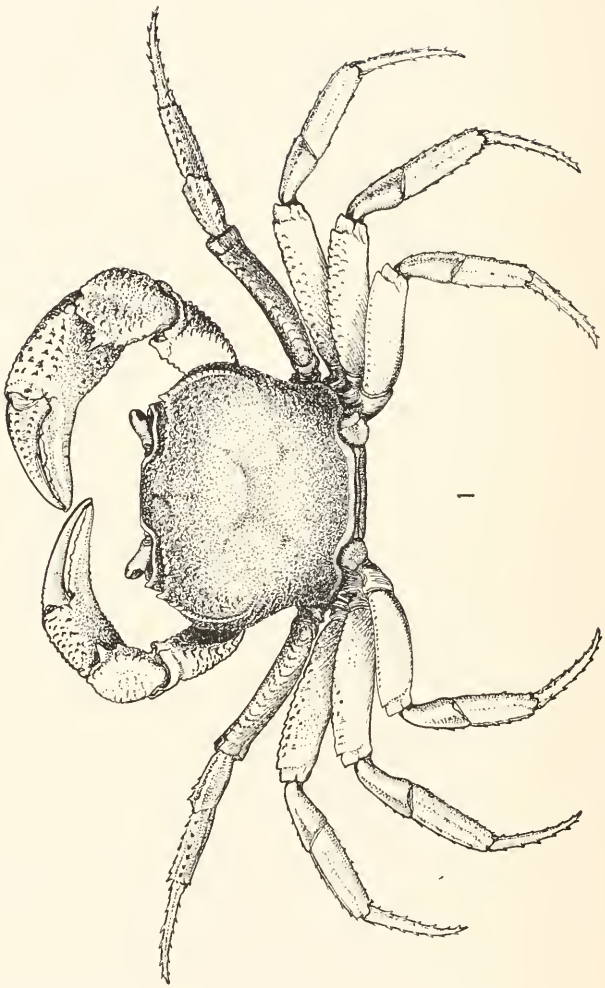

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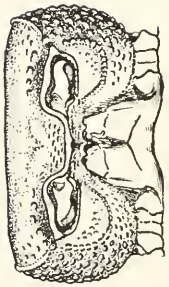

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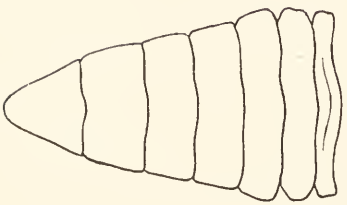


3

Potamon abbotti Rathbun.

VOL. XII, PP. 27-30 JANUARY 27, 1898

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF THREE NEW SPECIES OF FRESH-WATER CRABS OF THE GENUS *POTAMON*.*

BY MARY J. RATHBUN,

Of the three species here described, one is a typical *Potamon*, in which the postfrontal crest is developed but interrupted; the other two belong to the subgenus *Geothelphusa*, without a postfrontal crest. The first, *P. abbotti*, is from the Malayan Peninsula, and is related to a group of Indian species described by Wood-Mason. The second, *P.* (*Geothelphusa*) *levicervix*, was taken at the Loo Choo Islands with *P.* (*G.*) *dehaanii* (White) and *P.* (*G.*) *obtusipes* (Stimpson), by a Japanese collector, Mr. F. Sakamoto, and forwarded to the U. S. National Museum by Mr. Garrett Droppers. The third species, *P.* (*G.*) *macropus*, is notable as being the first member of the subgenus taken on the west coast of Africa. The other African species of *Geothelphusa* are *Potamon* (*Geothelphusa*) *berardi* (Savigny) from Egypt, *P.* (*G.*) *socotrensis* (Hilgendorf) from Socotra, and *P.* (*G.*) *emini* (Hilgendorf) from Victoria Nyanza. This last has faint indications of a crest, but so also has *P. dehaanii* (White), which is one of the two original species of *Geothelphusa*. On account of the presence of this feeble crest in *P. dehaanii*, it were better to consider *P. obtusipes* (Stimpson) as the type of the subgenus *Geothelphusa*.

Potamon abbotti sp. nov.

Pl. I.

Cervical suture obsolete; subbranchial regions distended laterally; merus of maxillipeds as long as wide.

* Published by permission of the Secretary of the Smithsonian Institution.

Carapace rather narrow, about four-fifths as long as broad, very convex in an antero-posterior direction, nearly level transversely in the widest part. Surface granulate and punctate, anterior and antero-lateral portions tuberculate or rugose. Cervical suture obsolete, except its posterior third. Postfrontal crest interrupted, tuberculate. Protogastric lobes oval, depressed, in advance of the remainder of the postfrontal crest and separated from it by a sulcus behind the inner angle of the orbit; the outer portion of the crest is concave forward and subparallel to the orbital margin, and terminates laterally in an acute epibranchial tooth, 2 mm. behind the orbital tooth. Behind the epibranchial tooth there is a raised tuberculate and convex margin extending half-way back on the carapace. The carapace is swollen laterally outside of and beneath this margin. Front (fig. 2) about one-fourth the entire width of the carapace; lower margin straight, sides oblique. The median suture is not continued in front of the protogastric lobes. Frontal and orbital margins strongly rimmed. Superior orbital margin sinuous; outer tooth broad, acute, separated from the crenulated inferior margin by a deep rounded sinus. Subbranchial regions crossed obliquely by short tuberculated rugæ which extend up to the postero-lateral margins. Suborbital region sparsely tuberculated on its posterior half.

The sides of the penultimate segment of the abdomen of the male are convex; terminal segment with slightly sinuous margins (fig 3).

Maxillipeds (fig. 4) with merus as long as wide, outer margins oblique, converging anteriorly. Chelipeds unequal in both sexes, very rough. Outer surface of merus rugose; margins with blunt teeth. Carpus rugose, a very strong inner tooth with denticles beneath. Hands very rough on the outer side, less so on the inner side. Fingers bent down, those of larger hand gaping a little at base. Ambulatory legs long and narrow.

Dimensions.—Male, length 35.5 mm., width 44, width between margins 41.5, inferior width of front 10.4; female, length 30 mm., width 37.5, width between margins 36, inferior width of front 9.5 mm.

Type locality.—Trong, Malay Peninsula; Dr. W. L. Abbott, 1896; one male, three females (U. S. Nat Mus. No. 20641).

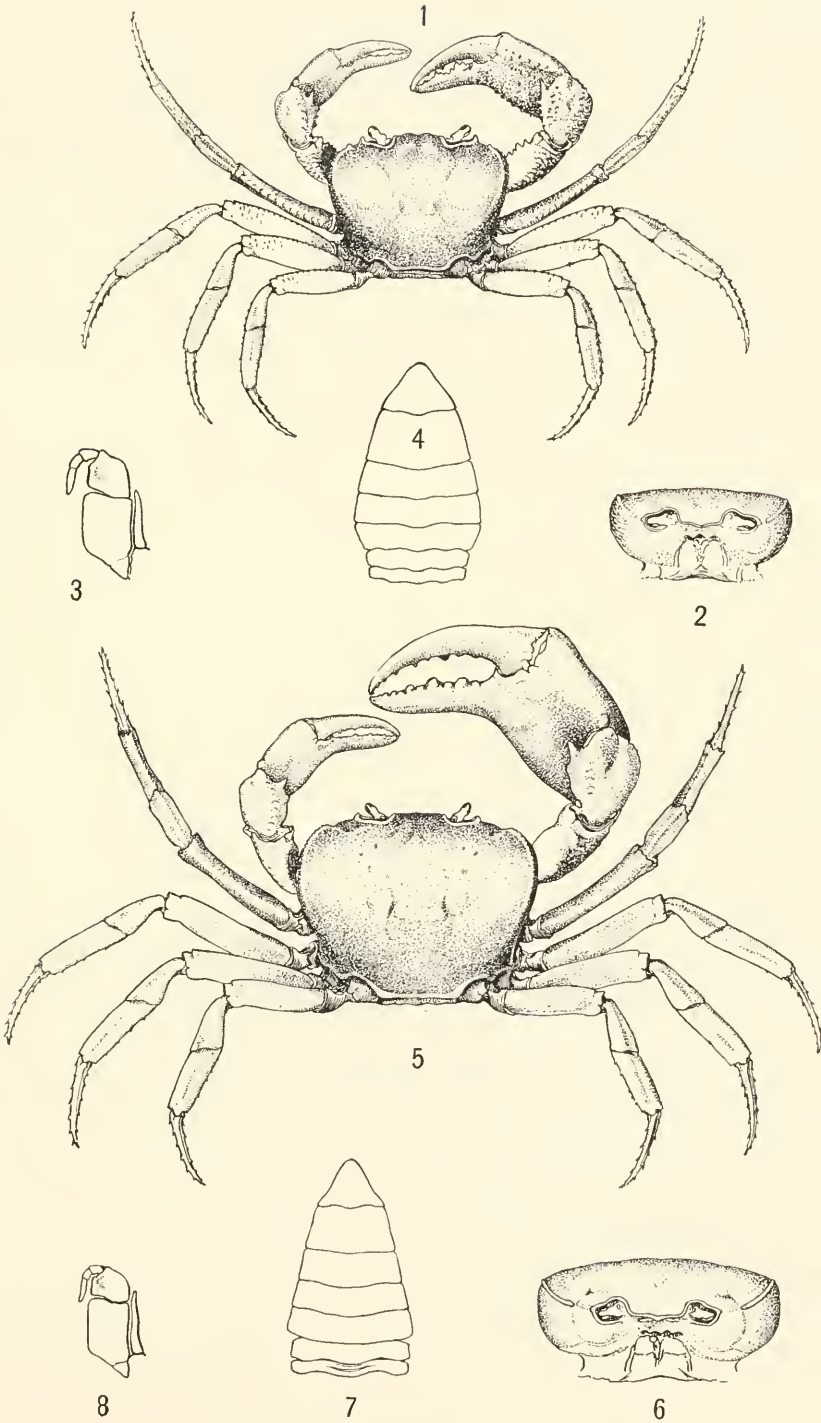
This species approaches nearest to *P. pealianus* (Wood-Mason) of Sibsaugor, Assam, but is separated from it by a number of prominent characters, viz., obliteration of cervical suture, swollen subbranchial area, elongate merus of the maxillipeds, slenderer legs, and narrower carapace.

Potamon (Geothelphusa) levicervix sp. nov.

Pl. II, figs. 5–8.

Postfrontal crest and cervical suture obsolete; epibranchial tooth blunt; legs long and narrow.

Carapace about three-fourths as long as broad, thick, very convex in a longitudinal direction, and less convex although distinctly and regularly so in a transverse direction. Surface smooth and punctate, with a few larger depressions on the anterior half. Cervical suture obsolete. Branchiocardiac depressions deep. Postfrontal crest absent; protogastric lobes in-



FIGS. 1-4. *Pelumnus gracilipes* Bell, var.

dicated only by depressions in front of their normal position. Epibranchial tooth 7 mm. from the orbit, very broad, obtuse, its outer margin a curve continuous with the curve from the tooth to the orbit, tooth bounded anteriorly by a broad notch. Equidistant from this notch and from the orbital angle and directly behind the latter is a deep transverse and somewhat triangular depression.

Antero-lateral margin tuberculate; subbranchial region visible outside the margin as a narrow rim. Front about one-fourth the width of the carapace, margin nearly straight and not visible in a dorsal view; the median suture does not extend to the margin. Orbits oblique in a front view (fig. 6), superior margin sinuous, directed outward and forward in a dorsal view, outer angle prominent, acute. Inferior regions of the carapace smooth, punctate; subcervical groove very deep. In the abdomen of the male (fig. 7) the sides of the sixth segment are oblique, of the seventh sinuous. The merus of the outer maxilliped is broad, with regularly rounded antero-lateral outline (fig. 8).

Chelipeds very unequal. Merus with outer surface and upper and outer margins somewhat rugose; inner and lower surfaces and inner margin smooth. Carpus slightly roughened, with a stout, triangular, blunt inner tooth, below which is a low swelling; anterior half marked by an irregular longitudinal depression. Larger hand very wide and thick, slightly rough, the raised lines forming reticulating lines which are punctate, the punctæ connected by minute impressed lines; space enclosed by the lines of a darker color; fingers long; pollex bent at an angle of 45° with the palm; fingers gaping to the tips. Smaller hand punctate, almost smooth and without conspicuous color marks; fingers slightly bent and little gaping. Ambulatory legs very long; surface slightly rough; merus joints with entire margins; carpal joints with a few spinules at the distal extremity; propodal joints with upper margins spinulous in the first and fourth pairs, distal and lower margins more or less spinulous in all.

Dimensions.—Male, length 48.5 mm., width 63.3, width between margins 61.5, width of front below 14.2.

Type locality.—Loo Choo Islands; F. Sakamoto; one male (U. S. Nat. Mus. No. 20642).

This species comes nearest to *P.* (*G.*) *transversus* von Martens, but is so different that they cannot be confused. The form of the abdomen and legs alone sufficiently differentiates them.

Potamon (Geothelphusa) macropus sp. nov.

Pl. II, figs. 1–4.

Postfrontal crest obsolete; cervical suture present; epibranchial tooth acute; ambulatory legs long and narrow.

Carapace very convex antero-posteriorly, slightly so transversely; about one-third broader than long; branchial regions much swollen laterally; posterior width greater than exorbital width. The surface is very finely granulate, and covered with small punctæ visible to the naked eye. The sutures of the carapace are shallow and the surface along their

boundaries is drawn in fine wrinkles. The cervical suture if continued would cross the orbital margin at its middle. The protogastric lobes are small but prominent. The front is about one-fourth the width of the carapace, deflexed, deepest in the middle, margin sinuous. The orbits are inclined obliquely downward and outward (fig. 2); superior margin sinuous and directed forward and outward, terminating at the outer angle in a prominent acute tooth. Margin of front and superior margin of orbit strongly rimmed. Inferior margin of orbit crenulate. Epibranchial tooth small, tuberculate, situated as far from the tip of the orbital tooth as half the width of the orbit; and succeeded on the lateral margin by small irregular tubercles for about half the length of the branchial region. Subbranchial region visible laterally outside the branchial margin and covered with short oblique granulated ridges. Suborbital area comparatively smooth, but with fine scattered granules; jugal area coarsely tuberculate.

The ischium of the outer maxillipeds (fig. 3) has a deep median furrow and large punctæ; merus rougher, slightly longer than wide, and its antero-lateral margin is obtusely rounded. The sixth abdominal segment of the male (fig. 4) is longer than the seventh and its proximal margin is convex, so that the fifth segment is longer laterally than in the middle.

Chelipeds very unequal. Meri elongate; margins armed with strong teeth; lower surface near antero-distal angle furnished with a stout downward-projecting tooth. The carpi are covered with granulated rugæ and the inner margin is spinous, the distal spine much the larger; outer inferior angle with a downward-pointing tooth. The propodi are covered with minute scabrous granules, among which are scattered larger granules set in punctæ; inner surface rougher than the outer. Pollex bent down. Both fingers deeply grooved; prehensile edges armed with very irregular blunt teeth; little gaping, the projections of the one finger in general fitting into the cavities of the other.

Ambulatory legs very long; meral joints compressed, upper margins spinulous; both margins of the propodal joints spinulous.

Dimensions.—Length 23.5, width 32, exorbital width 20.2, posterior width 23.2, width of front 8.8 mm.

Type locality.—Mouth of Mesurado River, Monrovia; O. F. Cook; one male (U. S. Nat. Mus. No. 20643).

EXPLANATION OF PLATES.

Pl. I. Potamon abbotti.

Fig. 1. Dorsal view, × $\frac{4}{5}$.
2. Front view, × $\frac{4}{5}$.
3. Abdomen of male, × $1\frac{3}{5}$.
4. Outer maxilliped, × $1\frac{3}{5}$.

Pl. II. Potamon macropus and levicervix.

Fig. 1. P. macropus, dorsal view, × $\frac{3}{4}$.
2. Front view, × $\frac{3}{4}$.
3. Outer maxilliped, × $1\frac{1}{2}$.
4. Abdomen of male, × $1\frac{1}{2}$.
5. P. levicervix, dorsal view, × $\frac{1}{2}$.
6. Front view, × $\frac{1}{2}$.
7. Abdomen of male, × $\frac{3}{4}$.
8. Outer maxilliped, × $\frac{3}{4}$.

VOL. XII, PP. 31-33 MARCH 24, 1898

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF TWO NEW SKUNKS OF THE GENUS *MEPHITIS*.

BY OUTRAM BANGS.

Mephitis spissigrada sp. nov.

Type from Sumas, B. C. No. 3699, ♀ adult, coll. of E. A. and O. Bangs. Collected September 30, 1895, by Allan C. Brooks.

General characters.—Externally, with much the general appearance of *M. hudsonica* and *M. occidentalis*, large size and long tail, peculiar to all the skunks of this group. Heel densely hairy; skull differing from that of either *M. hudsonica* or *M. occidentalis* in having a very short palate, the end falling at or forward of a line across posterior alveoli of last upper molars; palate ending in an even curve (like that of *M. hudsonica* and *M. mephitica mephitica*) without reëntrant notch (as in *M. occidentalis*) or median spine (as in *M. mephitica scrutator* and *M. elongata*).

Color.—As usual in the *hudsonica* group. Black all over, with white frontal stripe, nuchal patch, and lateral stripes extending from nuchal patch to and down sides of tail; the long white hairs of sides of tail overlie the shorter hairs and fall to the end of the blunt brush-like terminus of the tail.

Measurements.

	Total length.	Tail vert.	Hind foot.
No. 3699, type, ♀ adult.....	640	240	75
No. 3700, topotype, ♀ adult.....	610	230	75
No. 5548, topotype, ♂ old adult.....	...	270	85

Skull.—Type, ♀ ad. Basal length 68; occipito nasal length 69.6; zygomatic breadth 49.6; mastoid breadth 41; greatest length of single half of mandible 50.

Cranial characters.—Skull similar to that of *M. hudsonica* and *M. occidentalis*, but differing from both these in being shorter and broader and having shorter rostral region and shorter palate, the end of palate falling at or anterior to a line drawn across posterior alveoli of last upper molars

(in *M. hudsonica* and *M. occidentalis* the end of the palate falls well behind such a line). From *M. occidentalis* it differs still farther in having larger, rounder audital bullæ and the palate ending in an even curve (*M. occidentalis* having a reëntrant median notch), and from *M. hudsonica* in having much shorter, broader rostrum, wider nasals, and wider, flatter frontals.

Remarks.—Mr. Allan C. Brooks has sent me three skins and skulls and one extra skull (♂ old ad.) of this form, all collected by himself at Sumas, British Columbia. The species belongs to the very distinct *hudsonica* group, but seems different enough from either *hudsonica* or *occidentalis* to merit separation, though it may intergrade with both of them.

Mephitis avia sp. nov.

Type from San Jose, Illinois, No. 5747, ♂ adult, coll. of E. A. & O. Bangs. Collected March 10, 1897; skinned, measured, and sexed by H. H. & C. S. Brimley.

General characters.—Size rather small; tail very short; foot of medium length; heel clothed with long hairs along the sides, a narrow medial strip naked; colors as usual. Skull peculiar.

Color.—Black all over, except white frontal stripe, nuchal patch, and two lateral stripes extending back from nuchal patch. Tail very short and bushy, black externally, most of the hairs white at base.

Measurements.

	Total length.	Tail vert.	Hind foot.
No. 5747, type, ♂ adult.....	675	190	65
No. 5783, topotype, ♂ adult..	607	177	65

Skull.—The type ♂ adult. Basal length, 62; occipito nasal length 65; zygomatic breadth 44.6; mastoid breadth 35.4; greatest length of single half of mandible 46.4.

Cranial characters.—Skull short and heavy; highly arched in frontal region; palate broad at end and without median spine; zygoma broadly expanded at posterior end, then slanting abruptly forward (very different in shape from the more even curve seen in *M. mephitica*, *M. scrutatoo*, etc.); mastoid and paroccipital processes very much reduced; mastoid bullæ very large and much inflated; (these two last characters give this part of the skull somewhat the appearance of the skull of *Spilogale*.) Sagittal crest high; dentition normal, with the exception of upper carnassial tooth, which is unusually large.

Remarks.—*Mephitis avia* needs comparison with but one form, its nearest geographical ally, *M. mephitica scrutator*. It differs very much from that form in many ways. The short tail, the broad palate without median spine, the large much inflated mastoid bullæ, and peculiarly shaped zygoma distinguishing it.

I have a fine adult female skunk from Denver, Indiana, that is in every way exactly like examples of *M. mephitica scrutator* from Massachusetts

and Connecticut. So that it is probable that the range of *M. avia* does not extend very far to the east of the type locality. Undoubtedly it is the form of the central prairie region, being replaced in the north by *M. hudsonica* and in the east by *M. mephitica scrutator*.

Scrutator apparently reaches the height of differentiation in Louisiana. The series of skunks from Cartville and Point aux Loups Springs, Acadia Parish, Louisiana, from which I selected the type of *M. mephitica scrutator*, shows about the proportion of tail to total length found in specimens from the central Atlantic States. They are smaller, however, than examples from Massachusetts and Connecticut, and have smaller, lighter skulls and weaker dentition. Although they do not approach very nearly the larger, shorter-tailed *M. avia* with its heavy peculiar skull, still it is possible that intergradation may take place somewhere.

VOL. XII, PP. 35-38 MARCH 24, 1898

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF THE NEWFOUNDLAND OTTER AND RED FOX.

BY OUTRAM BANGS.

The following descriptions of the otter and the red fox of Newfoundland are based on material collected by Ernest Doane, now in the Bangs collection. Of the otter, he has sent a fine pair of adult skins with skulls, and two extra skulls; of the fox, six skins with skulls, and nine extra skulls. In addition to these I have examined a large series of unsexed otter skulls from Newfoundland in the Museum of Comparative Zoology at Cambridge.

Lutra degener sp. nov.

Type from Bay St. George, Newfoundland, No. 6965, ♂ young adult, Coll. of E. A. & O. Bangs. Collected April 23, 1897, by Ernest Doane.

General characters.—Size small, tail short, skull small and weak, with very light zygoma and narrow frontal and rostral regions.

Color.—Deep, lustrous seal brown to black all over, except cheeks, upper lips, chin, and under side of neck, which are grizzled brown, palest on cheeks; under fur light grayish brown at base and gradually darkening to deep rich brown at tips.

Cranial characters.—Skull as compared with that of *L. hudsonica* small and weak; whole frontal and rostral region narrow; postorbital processes long and slender; distance from last upper molar tooth to end of pterygoid process short; zygoma short and very slender; audital bullæ small; dentition normal.

Measurements.—♂ young adult (type); total length 998; tail vertebræ 358; hind foot 126. ♀ old adult, (topotype) No. 6966. Total length 990; tail vertebræ 352; hind foot 109.

Skull, ♂ young adult, (type); basal length 94.6; zygomatic breadth 66.8; mastoid breadth 60; interorbital constriction 22.2; greatest con-

striction behind postorbital processes 18.8; distance across postorbital process 32.4; last upper molar to end of pterygoid process 26; foramen magnum to end of palate 46.4; greatest length of single half of mandible 63.2.

♀ old adult (topotype) No. 6966; basal length 95.4; zygomatic breadth 70; mastoid breadth 63; interorbital constriction 22.8; greatest constriction behind postorbital processes 19.4; distance across postorbital process 33.6; last upper molar to end of pterygoid process 26.8; foramen magnum to end of palate 46.6; greatest length of single half of mandible 65.8.

Remarks.—The characters that separate *Lutra hudsonica* and *Lutra degener* are constant and well marked so far as my series goes. I have fine skins and skulls of *L. hudsonica* from Nova Scotia, New Brunswick, Maine, Massachusetts, and Connecticut, but unfortunately have seen but one skull, an imperfect one, from Labrador, though otter are common there.

I believe the Newfoundland otter is an island species, though I cannot be sure of this; possibly it occurs also in Labrador, as otter might easily swim the distance that separates Newfoundland from the continent if they so chose.

Henry Reeks, however, says of the Newfoundland otter:* "Both traders and settlers make two varieties or species (?) of the Newfoundland otters: one, which is called the 'country otter,' and principally frequents inland brooks and rivers, has the fur of a beautiful shining dark liver-brown, almost black on the back, while the other variety, called the 'salt-water' otter, *is said* (for I was unfortunate in not getting a specimen) to have the fur of a rusty brown color and to be considerably larger than the 'country otter,' although the skin is not nearly so valuable, rarely realizing more than three or four dollars, whereas good skins of the smaller and darker variety fetch from five to seven dollars."

Perhaps the 'salt-water' otter may be true *L. hudsonica* that occasionally visits the shores of Newfoundland and does not intermingle with the resident form there, *L. degener*.

Vulpes deletrix sp. nov.

Type from Bay St. George, Newfoundland. No. 6967, ♀ middle-aged adult, coll. of E. A. and O. Bangs. Collected April 24, 1897, by Ernest Doane.

General characters.—Size rather small; tail short; hind foot very large; feet and hands densely hairy beneath and armed with extremely long and stout claws; ears large, very woolly, and rounder than the ears of *V. pennsylvanica*. Color very variable; in 'red phase' pale ocher yellow (like the prairie fox). Skull but slightly different from that of *V. pennsylvanica;* dentition very strong, the carnassial tooth in particular being very large.

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* Zoölogist, March, 1870, page 2037.

*Color.**—Type in 'red phase.' Pelage extremely long and loose. Upper parts pale ocher yellow, to straw color, becoming darker and more rusty on inside of flanks, about shoulder, and on sides of face. Under parts dull white, including a narrow border to upper lip, the color of the upper parts extending down over sides and nearly meeting across middle of belly; chin dull brown; feet and hands black above as far as ankles and wrists, dull brownish yellow below, and densely haired with long loose hair, entirely obscuring the pads.

Tail short, pale, dull yellow with white tip, and irregularly overlaid in places with black tipped hairs; ears large and more rounded than in *V. pennsylvanica*, very thickly covered with woolly hairs, dull black above, yellowish white inside, and yellow at base. Under fur dull yellowish gray at base and yellow at tips, darker on flanks, rump, and under side of neck, and paler on back, shoulders, and belly.

No. 1178, ♀ very old; is a fine silver gray, being black all over except the back, which is beautifully variegated with silvery hairs. No. 6969, ♀ young adult, is a patch fox, being dark reddish brown all over, including tail, legs, and arms, except sides, top of head, parts of middle of back, and base of tail, where it has some yellow hairs intermixed. No. 6968, old nursing ♀, is about intermediate in color between the type and No. 6969, but has base of tail, inside of flanks, and region about fore shoulders a bright orange ochraceous. It is in worn pelage, with much of the long hair gone. A young, about one-third grown, No. 1180, is uniform deep black all over, tip of tail white, and a young, about one-half grown, No. 1179, is dull brownish ferruginous, with much black on legs, arms, tail, and under parts.

Cranial characters.—The skull differs but little from that of typical *Vulpes pennsylvanica*, except in being slightly wider and heavier and in having the whole rostral portion rather heavier and the audital bullæ constantly though slightly larger. The dentition is very much heavier throughout, the carnassial teeth in particular being very large and strong.

Measurements.—Type, ♀ middle-aged adult. Total length 959; tail vertebræ 336; hind foot 161; ear from notch 79. Average of four adult females: total length 958.5; tail vertebræ 342.5; hind foot 158; ear from notch 78.

Skull.—Type, ♀ middle-aged adult. Basal length 123.4; zygomatic breadth 72; mastoid breadth 47; least interorbital width 26.2; greatest length of single half of mandible 99.8. No. 6968, ♀ old adult topotype. Basal length 123; zygomatic breadth 72.8; mastoid breadth 46; least interorbital width 26.6; greatest length of single half of mandible 99.6. ♂ young adult topotype. Basal length 127.2; zygomatic breadth 70.2; mastoid breadth 46; least interorbital width 26; greatest length of single half of mandible 101.4.

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*All red foxes are somewhat brighter and more ferruginous in their fresh autumnal coats than they are in the spring. The hairs seem to become rather lighter and more yellowish as the tips wear off. This difference is slight, however, and even in full autumnal pelage the 'red phase' of the Newfoundland fox must be very pale.

Remarks.—The Newfoundland fox is easily distinguished from either typical *V. pennsylvanica* or *V. pennsylvanica rubricosa* by its very large hind foot, with long strong toes and tremendous claws. No. 1178, a very old ♀, taken June 9, 1894, at Codroy, is in worn summer pelage, and the long hairs on the under sides of the feet have worn down so that one pad on each foot can be seen. The long toes and heavy long claws are brought into great prominence, and make indeed a singular foot for a fox. As regards size and proportions, it needs no comparison with either *V. pennsylvanica* or the large, long-tailed, dark red form of Nova Scotia, *V. pennsylvanicus rubricosa*.

In color, the type and only specimen I have in the red phase (which I suppose to be normal) nearly matches many skins of the light yellow fox* of the northern prairies, from which form *V. deletrix* can be distinguished by much shorter tail, smaller size, proportionately larger foot, and heavy claws.

Vulpes deletrix is probably an island form, although there are occasionally times when it might cross from the mainland of Labrador to Newfoundland, or *vice versa*, on the ice; and as foxes do not hesitate to travel such distances on the open ice, it would not be surprising to find this form existing also in Labrador.

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* Whether the yellow fox of the northern and central prairies is identical with *Vulpes macroura*, which Baird originally described from a specimen from Great Salt Lake, Utah, is doubtful, although Baird himself, in 1857, included many specimens of the yellow form from Nebraska, Oregon, and Wyoming under that specific name. *Vulpes macroura* has also been applied to the yellow prairie fox by both Dr. Allen and Dr. Merriam, when either has had occasion recently to mention this animal.

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PROCEEDINGS

OF THE

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DESCRIPTION OF A NEW PARASITIC ISOPOD OF THE GENUS *ÆGA* FROM THE SOUTHERN COAST OF THE UNITED STATES.*

BY HARRIET RICHARDSON.

Two specimens of a species of *Æga*, heretofore undescribed, were obtained by the U. S. Fish Commission steamer 'Albatross' during its cruises in 1885 and 1886—one off Little Bahama Bank and the other between the delta of the Mississippi and Cedar Keys, Florida. They present no unusual characters, but differ from any of the known species of *Æga*.

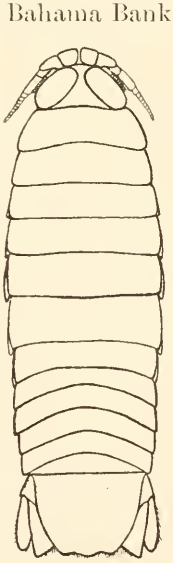

FIG. 1.—*Æga ecarinata* ($\times 2\frac{5}{7}$).

Æga ecarinata sp. nov.

Body elongate and narrow. Length more than three times greater than breadth. Surface punctate. Frontal margin of head bisinuated, the acumen separating the first pair of antennæ. Eyes large and oblong and situated at a small distance apart. First pair of antennæ extending almost to the flagellum of the second pair of antennæ; the first two joints of peduncle very broad; second joint extending anteriorly over the third joint, reaching almost to the extremity of that joint; third joint two-thirds narrower than first and second; the flagellum containing nine articles. Second pair of antennæ extending to the middle of the first thoracic segment; flagellum containing ten articles.

Epimera of all the thoracic segments narrow, the first two being rounded, the other four more acute at their extremities. First two pairs of prehensile legs rather stout; third

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pair less so, and the propodus of this pair is furnished with a large cultriform process. Five spines are present on the merus of all three pairs. Gressorial legs slender and sparsely spinulose.

Fig. 2.—*Æga ecarinata* ($\times 5\frac{3}{4}$).

a. Leg of 1st pair.
b. Leg of 3d pair.
c. Leg of 7th pair.

All the abdominal segments are visible in a dorsal view. Terminal segment broad and posteriorly bisinuated, forming three teeth with rounded extremities; its surface entirely smooth.

Outer branch of uropods narrower and somewhat shorter than the inner branch; its extremity is rounded. Inner branch obliquely truncate and crenulate on posterior margin. Uropods and terminal abdominal segment all fringed with a few hairs.

Two individuals of this species were found—one between the delta of the Mississippi and Cedar Keys, Florida, Station 2403, depth 88 fathoms; the other, the type (No. 21001, U. S. Nat. Mus.), off Little Bahama Bank, Station 2655, depth 338 fathoms.

This species is closely related to *Æ. tridens** Leach, but presents many specific differences: in the relative length and breadth of the body, the length being more than three times greater than the breadth in *Æ. ecarinata*, while in *Æ. tridens* Leach the length is only two and one-half times greater than the breadth; in the number of joints in the 1st and 2d pairs of antennæ, ten in the 1st pair and nineteen in the 2d pair being characteristic of *Æ. tridens* Leach, nine in the 1st and ten in the 2d pair being true of our species; in the presence of a cultriform process on the propodus of the third pair of prehensile legs, which process is entirely wanting in *Æ. tridens* Leach; and in the perfectly smooth surface in the present species of the terminal segment of the abdomen, which in the other species is tricarinated.

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* For synonymy, see Naturhistorisk Tidsskrift, vol. XII, 1879–'80, Schiœdte & Meinert, 'Symbolæ ad Monographium Cymothoarum, Crustaceorum Isopodum Familiæ,' p. 340–341.

VOL. XII, PP. 41-51 MARCH 24, 1898

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

THE ARCTURIDÆ IN THE U. S. NATIONAL MUSEUM.*

BY JAMES E. BENEDICT,

Assistant Curator, Division of Marine Invertebrates, U. S. National Museum.

When Mr. Beddard wrote the Report on the Isopoda collected by the 'Challenger' in 1886, but five species of *Arcturus* had been recognized. He added thirteen. Since his report no additional species have been described. In this paper five species taken by the 'Albatross' and one by the Point Barrow Expedition are described as new and a subspecies is raised to specific rank.

The structure and habits of the Arcturidæ are such that deep-water species are likely to occupy only restricted areas. The young are few in a brood and are cared for by the parent until well able to care for themselves, clinging to the mother's antennæ until ready to undertake a more independent existence, perhaps on the very object on which the mother is foraging for herself and brood. With habits of this kind the chances of a wide distribution for any one species must be very much less than is the case where free-swimming young are produced in large numbers.

The character of the marsupium of *Arcturus* is sufficient to separate this genus from *Astacilla*. The dactyls of some species of *Arcturus* are biungulate as in *Astacilla*.

Two species of *Astacilla* are described as new, one from the Straits of Magellan and a blind species from deep water (1,825 fathoms) off Martha's Vineyard. The finding of a blind *Astacilla* in deep water is a matter of no little interest. Mr. Beddard

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truly says of deep-sea Isopoda: *"Although the number of deep-sea species which have well-developed eyes is so large, they nearly all (all except three) belong to the two allied genera *Arcturus* and *Astacilla*, which thus form almost the only exception to the general statement that deep-sea Isopoda are blind." Of *Astacilla* he says: † "Unlike *Arcturus*, *Astacilla* is almost exclusively an inhabitant of the shallow waters, only one species, indeed, *Astacilla granulata*, ranging into deep water."

KEY TO THE SPECIES OF *Arcturus*.

a. End of the abdomen notched, as seen from above.
  b. Body smooth and free from spines ..... *beringanus.*
  b′. Body spiny.
    c. Head and six segments of the thorax each with a pair of spines on the dorsum ..... *longispinis.*
    c′. Head and segments of the thorax with not less than two pairs of spines to the segment.
      d. Second and third articles of the antennæ without spines except at the articulations ..... *hystrix.*
      d′. Second and third articles of the antennæ with spines on the bodies of the articles..... *murdochi.*
a′. End of the abdomen without notch.
  b. Thorax without spines above the epimera.
    c. Abdomen acute or subacute at extremity.
      d. Eyes elevated on peduncles..... *oculatus.*
      d′. Eyes not elevated on peduncles.
        e. Extremity of abdomen notched in a lateral view.
          f. Thorax very tubercular..... *stebbingi.*
          f′. Thorax not tubercular..... *abyssicola.*
        e′. Extremity of abdomen without notch.
          f. Fourth segment of the thorax much longer than the preceding segments. *glabrus.*
          f′. Fourth segment of the thorax but little longer than the preceding segments.
            g. Thorax with large swellings or tubercles..... *tuberosus.*
            g′. Thorax without tubercles..... *myops.*
    c′. Abdomen rounded at extremity.
      d. Abdomen notched at its extremity in lateral view ..... *spinifrons.*
      d′. Abdomen without notch at its extremity.
        e. Epimeral spines present..... *anna.*
        e′. Epimeral spines wanting..... *coppingeri.*

* Report on the Isopoda collected by the 'Challenger,' p. 166.
† *Op. cit.*, p. 107.

b′. Thorax with spines above the epimera.
  c. Spines present in front of the ocular space.
    d. Spines, spinules, or spiny tubercles very numerous on the thorax.
      e. Spines all long and slender .... *multispinis.*
      e′. Spines all short or with a few long ones.
        f. All spines short.
          g. Third segment of antennæ spinulose..... ..... *furcatus.*
          g′. Third segment not spinulose.... *glacialis.*
        f′. Spines long and short.
          g. With three spines extending back from the abdomen..... *spinosus.*
          g′. With two spines extending back from the abdomen..... *americanus.*
    d′. Spines of the thorax comparatively few.
      e. Last segment of the abdomen with a carinate median line.
        f. Second segment of abdomen with spines ..... *cornutus.*
        f′. Second segment without spines..... *tenuispinis.*
      e′. Last segment without carina.
        f. Abdomen armed with a long median spine which projects beyond the end of the segment.
          g. Upper surface of abdomen smooth. *purpureus.*
          g′. Upper surface spinulose ..... *studeri.*
        f′. Abdomen without median spine..... *brunneus.*
  c′. Spines absent in front of the ocular space.
    d. Head free from spines..... . . *feildeni.*
    d′. Head with spines present between the eyes.. *baffini.*

Arcturus baffini (Sabine).

Idothea baffini Sabine, Appendix to Parry's First Voyage, p. 50, pl. i, figs. 4–6, 1824.

Arcturus tuberculatus Latreille in Cuvier, Règne Animal, ed. 2, IV, p. 139, 1829.

Arcturus baffini Westwood, Trans. Entom. Soc. Lond., vol. I, p. 72, 1836.
Milne-Edwards, Hist. Nat. Crust., III, p. 123, pl. xxxi, fig. 1, 1840.
Sars, Crust. Norw. North Atlantic Expd., p. 97, pl. ix, figs. 1–21, 1885.
Beddard, Report on the Isopoda collected by the 'Challenger,' pl. xx, fig. 12, 1886.

The best figures of this species are, in my opinion, those of Professor Sars. It is the oldest and best known species of the genus, and has been taken over a larger range than any other. Its characters are so well marked that it can be readily separated from any other species in the collection.

Arcturus feildeni Miers.

Arcturus baffini var. *feildeni* Miers, Ann. and Mag. Nat. Hist. (4), XX, 64, 1877.

The head is a little broader than long when the length is measured on the side; the surface presents three areolations, two circular ones a little in front of the line of the eyes and a long transverse one behind the eyes.

The antennæ are equal to the body in length—36 mm.; the fourth and fifth joints are each 11 mm.

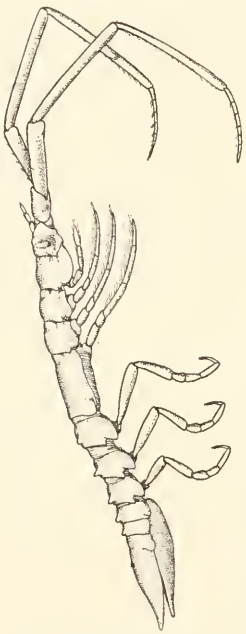

Fig. 5.—*Arcturus feildeni*. (×1½.)

The four anterior segments of the thorax are without spines or tubercles; two slight areolations near the anterior border of the second and third segments do not correspond to the spines of *baffini*, as they exist on that species in addition to the spines. The fourth segment is equal in length to the two preceding. The three posterior segments of the thorax and the two anterior segments of the abdomen are each provided with a pair of small blunt spines.

The middle surface of the abdomen is without any indication of the prominent spiny projections of *baffini;* the median line, on the other hand, shows when dried a slight irregular median groove. The conical lateral projections of *baffini* are altogether wanting in this species. The epimera are also much modified in *feildeni;* they are much less pointed, and are directed downwards, making them inconspicuous from a dorsal view. The surface of the body is glabrous. The above description is based on a single specimen labeled 'Camp Clay, Cape Sabine; Lieut. [now General] A. W. Greely.' (No. 12416, U. S. N. M.) A much larger and less typical specimen is labeled '*Arcturus baffini* var. *tuberosus*, Davis Straits.' This is identical with the Cape Sabine specimen, except that the spines of the posterior segments are reduced to very low tubercles. The range of variation, as indicated by the two specimens, is easily within specific limits; both are far removed from *A. baffini*. Length of specimen from the front to the abdomen 50 mm. (No. 20333, U. S. N. M.).

Arcturus longispinis sp. nov.

This species, though well marked, partakes strongly of the characters of *baffini*, the type of the genus.

The head is deeply concave in front; the margin does not form a true curve, but shows slight projections between the median and outer antennæ. The eyes are triangular and conspicuously protruding. The

basal joints of the median antennæ are oblong and flattened; the outer antennæ are 52 mm. in length; the first two joints are but little longer than broad, while the three distal joints are long; all are unarmed; the flagellum is composed of about 12 short segments.

The spines of the head and dorsal region are placed like those of *baffini*; with the exception of those on the posterior portion of the thorax, they are much longer than in any specimen of *baffini* that I have seen; the spines of the head are 6.5 mm. in length, while those of the second, third, and fourth segments are but little shorter. The spines on these segments are united at the base by a low ridge which curves up on the spines, giving them the appearance of parts of a single structure. Between the anterior spines and the epimeral projections on their respective segments are low protuberances; ridges also run from the bases of the spines along the margins to the posterior angle of the segments, leaving a deep transverse groove below the spine. The spines of the first thoracic segment are very small and inconspicuous; it is possible that this segment may not be normal in regard to the spines, as it is partially overgrown by a colony of Polyzoa.

The epimera of the second, third, and fourth segments increase in size posteriorly; they are flattened on the exposed surface and evenly rounded below; there is a depression on the exposed face. Viewed from above, the epimeral projections are covered by large rounded tubercles on the lower margins of the segments. The epimera of the fifth, sixth, and seventh segments decrease in size posteriorly, and are broad and wedge-shaped; the spines of these segments are the same in character as those of the anterior segments, but are much smaller, measuring on the fifth 3 mm., the sixth 2.3 mm., seventh 2 mm.

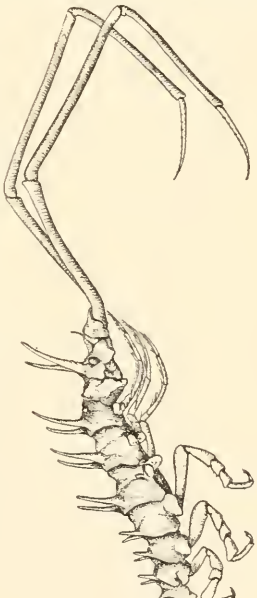

Fig. 4.—*Arcturus longispinis.* (× 1½.)

The first abdominal segment is very short, with two small spines above and two conical projections below; the second segment has two long spines above, pointed backward, and none below; the terminal segment has two spines pointing backward inserted at about the middle of the dorsal surface; at this point the segment is rapidly depressed to the terminal points; the lower margin has two pairs of triangular projections; *A. baffini* has but one pair.

Station 3599, latitude 52° 05′ 00″ N., longitude 177° 40′ 00″ W., 55 fathoms. Type (No. 20530, U. S. N. M.).

Arcturus glabrus sp. nov.

The head is wider than long, measured in the constriction in front of the eyes and on the median line, but longer than wide if the side of the head is taken.

The antennæ are longer than the body in both sexes; much longer in the female than in the male.

There are no spines or tubercles on the head or posterior to it. The segments of the thorax and abdomen are smooth to the eye and are finely reticulated under a lens. The fourth segment differs in the sexes; in the male it is a little longer and more slender than the two preceding segments taken together; in the female it is shorter and stouter; so different is the appearance that the sexes can be readily separated in a dorsal view. The anterior margins of the second, third, and fourth segments are notched on the median line.

Fig. 5.—*Arcturus glabrus*, ♂. (× 1¼.)

The abdomen is composed of two segments, anchylosed, the usual second segment being only indicated by a swelling above and a short suture at the side. There are no lateral projections on the abdomen; the epimera of the posterior part of the thorax cannot be seen from above. The dactyls of the posterior feet are biungulate. The length of the body of a male is 31 mm.; of the antennæ 38 mm.; female, body 28 mm.; antennæ 45 mm.; female, body 24 mm.; antennæ 39 mm.

A number of specimens of this species were taken by the 'Albatross' at Station 3599, in Bering Sea, lat. N. 52° 05′, long. W. 177° 40′, in 55 fathoms (No. 20529 U. S. N. M.).

Arcturus beringanus sp. nov.

The head is excavated in front; the lateral projections are broad; deep constrictions or depressions exist both in front and behind the eyes. The antennæ when laid off on the body reach the base of the abdomen; the fourth and fifth articles are very long; the flagellum is composed of seven or eight articles; the antennulæ reach to the end of the second article of the antennæ.

Fig. 6.—*Arcturus beringanus*. (× 2¼.)

The first and last three segments of the thorax are nearly equal in length; the fourth segment is a little more than twice as long as any of the others. The posterior margins of the segments are concave on each side of the median line to the posterior angle of the segments, making a more or less acute point at the middle of the segment and lobate posterior angles.

The abdomen is elongated and slender; the first and second segments are clearly defined; a third is indicated by a deep and irregular constriction; the terminus is incised.

A large number of specimens show a light line running along the median line of the dorsal surface and along the sides in line with the eyes. The dark colored or shaded portions of the surface are made up of numerous black spots. Now and then a large female is very light in color, the lines being but slightly indicated.

The largest specimens are 18 mm. in length.

Station 3252, lat. 57° 22′ 20″ N., long. 164° 24′ 40″ W.; depth 29½ fathoms; specimens very numerous. (Type, No. 20529, U. S. N. M.) Station 3253, lat. 57° 05′ 50″ N., long. 164° 27′ 15″ W.; depth 36 fathoms; four specimens. Station 3637, lat. 57° 06′ 30″ N., long. 170° 28′ 00″ W.; depth 32 fathoms; one female with a single young clinging to the antennæ.

Arcturus tenuispinis sp. nov.

This species is very close to *A. cornutus* Beddard. The head is deeply excavated in front; a pair of spines arise in front of the interocular space and extend forward, diverging a little more than those of *A. cornutus*. The first segment of the antennæ extends beyond the lateral projections of the head not more than 0.2 of a mm.; the second joint measures about 1.4 mm. on the upper surface, the third joint 5 mm., and the fourth 13 mm. in length; the fifth joint is lost or broken in both specimens. The antennulæ reach the middle of the third segment of the antennæ. The first and second thoracic segments are both armed with epimeral spines and a pair farther back and higher up on the segment; the other segments of the thorax have epimeral spines only; the first segment of the abdomen has a pair of spines in line with the epimeral spines of the thorax; the second segment is altogether unarmed; the last segment has two paired spines and one unpaired; the latter is at the terminus of a dorsal carina which can only be made out with difficulty. The largest spines on the body are the pair at the sides on the proximal end; the spines at the distal end are slender; the terminal outline of the segment is rounded.

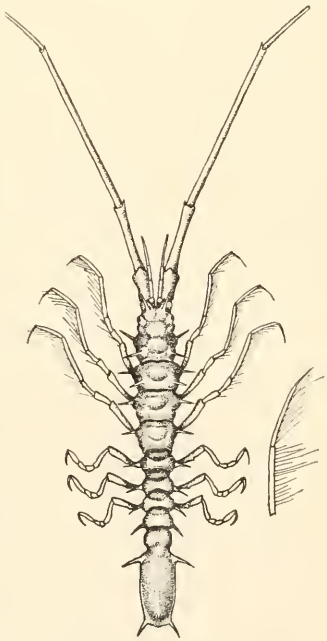

Fig. 7.—*Arcturus tenuispinis*. (× 2.)

A. tenuispinis can be distinguished from *cornutus* by the more slender spines, by the lack of the extra pair on the third and fourth segments of the thorax, the unarmed second segment of the abdomen, the lack of

spines on the joints of the anterior series of ambulatory legs, and by the outline of the abdomen. Length of the largest specimen 23 mm.

Station 2756, off Cape St. Roque, Brazil, lat. 3° 22′ 00″ S., long. 37° 49′ 00″ W., 417 fathoms; two males (No. 21252, U. S. N. M.).

Arcturus americanus Beddard.

Arcturus americanus Beddard, Report on the Isopoda collected by the 'Challenger,' p. 104, pl. xxiii, figs. 5-8, 1886.

Color of specimens in alcohol: Body light straw color; the head is shaded with purple; this shade continues in two broken lines to the sixth segment, where the lines are united, spreading again on the abdomen. Another broken line runs along the second, third, and fourth segments at a little distance above the epimera; on the posterior segments the line is continued close to the epimera. There are two purple rings on the third joint of the antennæ and a broad band near the distal ends of the fourth and fifth joints.

Specimens were obtained at two stations off the east coast of Patagonia: Station 2768, lat. 42° 24′ 00″ S., long. 61° 38′ 30″ W., 43 fathoms; Station 2770, lat. 48° 37′ 00″ S., long. 65° 46′ 00″ W., 58 fathoms; four specimens.

Arcturus multispinis sp. nov.

The head is a little elongated; the front is concave. The eyes are round and stand out from the sides of the head as hemispheres. Two spines are placed near the front in advance of the line of the eyes and a transverse line of six a little behind the eyes; the terminal spines of the row are much smaller than the others.

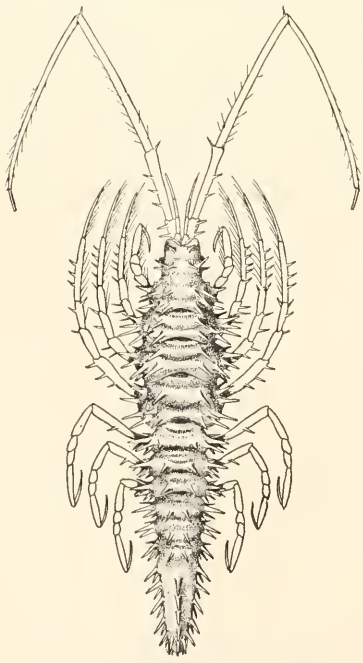

Fig. 8.—*Arcturus multispinis.* (× 2½.)

The antennæ are 28 mm. in length and slender in comparison with those of the Arctic forms; there are two spines on the second segment and two on the third segment of one, and three on the other; the fourth segment is armed with a single spine at its articulation with the fifth segment; the fifth segment is considerably longer than the fourth; the flagellum is short and without joints.

The two spines near the front form the anterior ends of two rows that extend to the last segment of the abdomen; the first four segments of the thorax have a transverse constriction making them in appearance double segments; both the anterior and posterior portions of these segments furnish a pair of spines for the lateral dorsal lines of spines; after

the fourth segment there is but a single pair to a segment; the lines are not continued on the last segment, but are here replaced by a row of five spines on the median line of this elongated segment.

The second segment of the thorax is soldered to the head as in other species, otherwise its dorsal armature is like that of the three following segments. The epimera of the four anterior segments of the thorax are moderately extended and bear from two to four spines; between the epimera and the lateral dorsal lines are two spines; there is another spine just behind the epimera.

The three posterior thoracic segments are much shorter and narrower than the preceding segments; the epimera bear but a single spine; the spines of the lateral dorsal lines are smaller than the anterior spines of the line; on the fifth segment, between the line and the epimera, are three spines; on the sixth two spines, on the seventh one spine. The first two segments of the abdomen are dorsally like the last segment of the thorax; the last segment is elongated and bears five rows of spines—one on the median line and two on each side; there is a longitudinal row of five spines on each valve of the operculum. Length of body 23 mm.

Station 2807, off the Galapagos Islands, lat. 0° 24′ 00″ S., long. 89° 06′ 00″ W., 812 fathoms. One female with eggs (No. 21253, U. S. N. M.).

Arcturus murdochi sp. nov.

Arcturus hystrix Harger in Murdoch, Report Expedition to Point Barrow, Alaska, p. 142, 1885.

This species is closely related to *A. hystrix*, Sars, from off Helgoland and Lofoten, from depths ranging from 350 to 457 fathoms. Both specimens of *A. murdochi* came from 13½ fathoms 10 miles west of Point Franklin, Alaska, collected by the Point Barrow Expedition.

Fig. 9.—*Arcturus murdochi*. (× 3½.)

The head is deeply concave in front; the sides of the head extend forward in front of the eyes and end in bifurcate projections. On the front margin of the head is a single spine, conspicuous in being the only spine occupying the median line throughout the length of the animal. A spine on each side of the median spine divides the space between the eyes, making a row of three spines on the front of the head just in advance of the anterior line of the eyes. The median spine is a little in advance of the other two. A row of eight spines occupies the posterior part of the head; four of them are higher up than the eyes—one pair behind the eyes and one below on the margin of the head; the spines behind the eyes are the smallest.

The antennulæ are very short and small, hardly reaching the antepenultimate joints of the large antennæ; the basal joints are wider and shorter than those shown by Professor Sars in his figures of *hystrix*. The basal joints of the antennæ are small and are concealed from a dorsal view by the lateral projections of the head.

The second joint is about as broad as long and is armed with three short spines; the third joint is armed with two spines pointing outward and upward; the fourth and fifth joints are long and slender, unarmed; the flagellum has but three joints. The first thoracic segment, as in *hystrix*, has a transverse row of eight spines; the thin sides of the segment extend forward under the head; the second and third segments also have eight spines arranged as in the first. The fourth segment is so constricted in the middle as to give it the appearance of two segments anchylosed; this segment has a double row of eight spines; between the two median spines of the posterior row and the constriction are two additional spines; these spines are smaller than those of the median rows, taking the arrangement longitudinally. The fifth, sixth, and seventh segments have spines regularly placed on each side of the median line; next farther down on the segment are two spines longitudinally placed; next, on the margin, are three spines united at the base, the middle one largest. The first abdominal segment is very short, with a transverse row of six spines; on the second segment spines are placed on the two median lines only; these are doubled and crowded. On the terminal segment there are two rows of small spines regularly placed on one specimen and disarranged on the other. The abdomen is terminated by two blunt divergent spines. The specimens are sparsely set with short, stiff hair. All of the legs are armed with a single spine on the basal joint.

This species can readily be distinguished from *hystrix* by the median spine of the head, by the extra pair of spines on the fourth segment of the thorax, by the armature of the antennæ, and by the arrangement of the spines on the abdomen.

As Professor Sars suggests, *hystrix* may be made the type of a new genus; it will then be necessary to place this species with it. (No. 7915, U. S. N. M.)

Astacilla granulata (G. O. Sars).

Leachia granulata G. O. Sars, Arch. Math. Nat., II, p. 351, 1877.
Astacilla americana Harger, Am. Journ. Sci., (3) XV, p. 374, 1878.
Astacilla granulata Harger, Proc. U. S. Nat. Mus., II, p. 161, 1879.
Astacilla granulata Sars, Nor. N. Athan. Expd., Crust., p. 107, pl. ix. figs. 27–35, 1885.

One specimen from the Gloucester fishermen, Grand Banks.

Astacilla diomedeæ sp. nov.

The head is excavated in front, nearly rectangular, a little broader behind than in front. The eyes are but little swollen, are round, and are situated a little anterior to the middle of the margin.

The antennæ are closely like those of *Astacilla nodosa* (Dana).

The first segment of the thorax has the same width as the head; the second and third segments are successively wider and also shorter than the first; the fourth segment is very wide at the anterior end, as in *nodosa*; like the latter, it tapers gradually backward to the fifth segment. The segments posterior to the fourth are longer than the first three and are successively narrower.

The abdomen is constricted at the base and has subparallel sides; from the slight postero lateral protuberance it narrows rapidly to the apex.

The animal is throughout smooth and glabrous; the median line is light in color; on the fourth segment the light color broadens out and the sides are blotched with dark shadings made up of small black spots; all the articles of the antennal peduncles have a narrow ring of black at the distal ends, except the fifth.

Described from a single female dredged by the 'Albatross' in the Straits of Magellan from a depth of 17 fathoms (Station 2774). The marsupium is filled with eggs (No. 21251, U. S. N. M.).

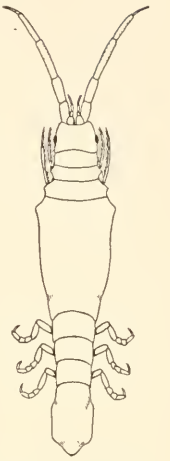

Fig. 10.—*Astacilla diomedeæ*. (× 6.)

Astacilla cæca sp. nov.

The head is deeply excavated to receive the antennulæ; the excavation is deeper at the sides than on the median line; a rostriform point extends between the antennulæ. The lateral prolongations of the head have two paired digital processes near the lower margin; one pair only can be seen from above. The antennæ reach back to the end of the sixth segment. As in other species of the genus, the first thoracic segment is solidly united to the head; the lower margins of the segment are tubercular. The second thoracic segment is short and narrow; the third is a little longer and wider; the fourth or long segment is yet wider at the anterior end, caused by the swellings at the insertions of the legs; after this it tapers gradually to near the posterior end, where the taper is more rapid. The fifth, sixth, and seventh segments are successively narrower. The median line of the head and thorax is tubercular; the head has one tubercle near the front and another on the postcephalic lobe; all thoracic segments have a tubercle on the line; the lateral margins of all are angular; above the epimeral projections of the fifth segment are four paired tubercles. The first segment of the abdomen is narrow and forms a neck between the thorax and the broad and angular terminal segment. The terminal segment has a pair of angular projections on each side of the margin; between the angles the margin is but little arcuate; posterior to the last angular projection the outline is that of an equilateral triangle. Attached to the carapace are several specimens of Foraminifera which Dr. Flint tells me belong to the genus *Truncatulina*.

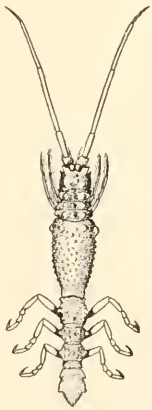

Fig. 11.—*Astacilla cæca*. (× 3.)

Both specimens have been repeatedly examined for a trace of eyes without success.

Length of the large specimen (female) 9 mm., measured from the front.

Station 2714, lat. 38° 22′ 00″ N., long. 70° 17′ 30″ W., 1825 fathoms (No. 12026, U. S. N. M.).

Vol. XII, pp. 53-55 March 24, 1898

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

TWO NEW ISOPODS OF THE GENUS *IDOTEA* FROM THE COAST OF CALIFORNIA.*

BY JAMES E. BENEDICT,

Assistant Curator, Division of Marine Invertebrates, U. S. National Museum.

The two species described in this paper come within the limits of *Idotea* as recognized by E. J. Miers in his monograph of the Idoteidæ.† If several more species are found with the epimeral characters of *Idotea carinata* Lucas and *I. rostrata* here described, the former species may become the type of a distinct genus. At present the division would, in my opinion, be unwarranted.

Idotea rostrata sp. nov.

This species is probably more nearly related to *Idotea carinata* Lucas‡ than to any other described *Idotea*.

The head is excavated in front; the antero-lateral angles are rounded and upturned. The eyes are lateral, large and very slightly projecting. Above the eyes the head is elevated. The head projects forward on the median line forming a tubercular rostrum. In the larger specimen the occipital suture is an irregular impressed line; the entire surface of the head is minutely rugose. The articles of the peduncle of the antenna are short and stout; the length of any article not being more than two or two and one-half times its greatest width. The flagellum on one side is composed of seven stout and distinct segments, on the other side of six.

* Published by permission of the Secretary of the Smithsonian Institution.

† Journ. Linn. Soc. Lond., XVI, pp. 1–88, 1883.

‡ Lucas, Hist. Nat. des Anim. in Expl. Sci. Algérie, Crust., p. 60, pl. vi, fig. 1, 1849. Miers, Journ. Linn. Soc. Lond., XVI, p. 58, 1883.

The antennulæ reach the distal margin of the third segment of the antennæ; their basal joints are broad.

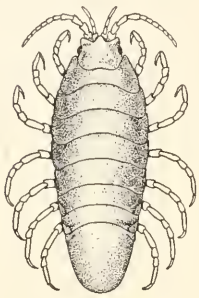

Fig. 12.—*Idotea rostrata.* (× 3.)

The thorax is convex and nearly smooth; the first, sixth, and seventh segments are about equal in length; the third, fourth, and fifth are broadest; the second is intermediate; the first segment, as in *carinata*, is deeply excavated, the antero-lateral lobes reaching to the eyes; both lateral angles of the other segments are about equally rounded. The epimera show only on the three posterior segments; on the fifth it shows slightly on the middle of the margin; on the sixth it occupies the posterior two-thirds and is quite broad posteriorly; on the seventh its occupies one-half the margin and is triangular in form.

The legs are moderately slender. With the exception of the first pair, the basal articles of all have a small tubercular protuberance.

The abdomen tapers with the body and is evenly rounded behind; it consists of a single segment with a suture near the base as in *Synidotea*. The operculum is not crossed by an oblique line. There is a broad shading of purple along the dorsum. The margins of the articles of the antennæ and the dactyls are rosy.

This description is made from two females from San Pedro, California, presented by Mr. S. J. Holmes. The larger specimen is 12 mm. in length. The sides of both are arcuate as is usual in the females of *Idotea*.

Idotea stenops sp. nov.

A single large female *Idotea* is in the collection from Monterey, California, where it was taken by Mr. Henry Hemphill.

In general appearance the species closely resembles *I. ochotensis*, but more careful examination shows it to be specifically distinct. The outline of the body is similar to that of the female of *ochotensis*. The head is more deeply excavated on the anterior margin than in that species. The posterior margin is concave.

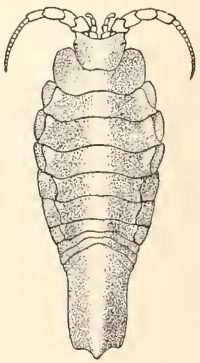

Fig. 13.—*Idotea stenops.* (Natural size.)

The eyes are situated a little behind the middle of the exposed lateral margin and are five times longer than broad, placed transversely just anterior to the eye, the surface and margin excavated.

The antennæ are similar to those of *ochotensis*, but the flagellum has 15 articles.

The thorax is widest at the third and fourth segments. The epimera of the second segment reaches the postlateral angle and is much wider in the anterior portion. The epimera of the third and fourth segments are

widest in the middle and cover the ends of the segments with the exception of the apex of the posterior angles. The epimera of the fifth, sixth, and seventh segments cover the ends of the segments and are very wide on their posterior margins.

The epimera of *ochotensis* are strikingly different. In the second segment they occupy the anterior half of the margin, in the third about three-fifths, and in the fourth the anterior three-quarters. The epimera of the fifth segment covers all but the apex of the posterior angle. The margins of the sixth and seventh segments are covered by the epimera. In the last three segments the anterior part of the epimera is narrow where in *stenops* it is wide.

The abdomen of *stenops* is composed of three segments. Another segment is indicated by a suture. The basal half of the abdomen is tapering; the posterior half has parallel sides; the posterior angles are rounded and very slightly produced behind. The apex is acute. The surface of the body below the median line is flattened, forming an obtuse ridge from the base of the head to the apex of the abdomen.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTION OF NEW BIRDS FROM MEXICO, WITH A REVISION OF THE GENUS *DACTYLORTYX*.

BY E. W. NELSON.

Further study of the Mexican birds in the collection of the Biological Survey, U. S. Department of Agriculture, reveals the presence of several apparently undescribed species and subspecies. These new forms, like those already described from this collection, were obtained by Mr. E. A. Goldman and myself during our explorations in Mexico for the Biological Survey. Our work has covered a large portion of that country, and although far from exhaustive has been conducted systematically, with the desire to secure series of specimens from various altitudes and areas with a view to determining the faunal relationships of the different sections. Up to the time our work began, some six years ago, ornithologists had given little consideration to the fact that Mexico has various well-defined climatic areas aside from the two main divisions of highland or temperate, and lowland or tropical. The fact is that the highlands contain several definite faunal areas, and the same is true of the lower tropical lands. Faunal work in the United States has shown very clearly the differentiation produced in wide ranging species by varied climatic conditions. In many instances this variation is so gradual that the different extremes are given subspecific rank; in others the resultant forms are sufficiently segregated to be accepted as full species. Precisely the same state of affairs exists in Mexico. The material collected illustrates these conditions, and will aid materially in working out the subordinate faunal areas of that country.

I have to acknowledge again my indebtedness to Dr. C. Hart Merriam, Chief of the Biological Survey, for his interest in the work on Mexican Birds, and to Mr. Robert Ridgway, Curator, and Dr. Chas. W. Richmond, Assistant Curator, of Birds in the National Museum, for continued favors at their hands.

All measurements are in millimeters.

Heleodytes brunneicapillus obscurus subsp. nov. Mexican Cactus Wren.

Type No. 142789, U. S. Nat. Mus., Biological Survey Coll. Ad. ♂, Tula, Hidalgo, Mexico, March 9, 1893. Collected by E. W. Nelson and E. A. Goldman.

Distribution.—Tableland of Mexico.

Description.—Similar to *H. brunneicapillus*, from which it differs mainly in its smaller size, darker crown, grayer back, more spotted chin, and the obsolescence of white streaks on back.

Average dimensions of *H. brunneicapillus obscurus:*

Ad. ♂ (5 specimens): wing 85.8; tail 77.8; culmen 22.8; tarsus 27.6.
" ♀ (5 "): " 84.4; " 77.4; " 21.6; " 26.4.

Averages of *H. brunneicapillus* (from southern California and Arizona):

Ad. ♂ (5 specimens): wing 90.4; tail 84.4; culmen 23.2; tarsus 29.2.
" ♀ (5 "): " 85.2; " 81.8; " 21.6; " 27.2.

The crown and nape on birds from the Mexican tablelands are sepia or clove brown instead of burnt umber, as in those from southern California and the southern border of the United States in general. This southern form is dark grayish-brown on the back, lacking the paler or more rufous shade of *brunneicapillus* proper. The white shaft lines of the dorsal feathers are much reduced in width and are commonly broken up into isolated spots. In viewing the dorsal surface of a series of the two forms placed side by side the notable amount of streaking on typical *brunneicapillus* contrasts strongly with the broken streaks and irregular white spotting on the backs of *obscurus*.

Specimens from northern Zacatecas show an approach to the northern bird; those from the State of Nuevo Leon, in northeastern Mexico, are intermediate in some characters, but may possibly represent a form peculiar to the Tamaulipan region. Nearly typical representatives of *H. brunneicapillus* and *H. b. obscurus* are represented in the U. S. National Museum series from southern New Mexico, and it is possible that both may occur there, each having its range limited to certain altitudes. In this case I should expect to find true *brunneicapillus* ranging below *obscurus*.

The distribution of the two forms, so far as the material at hand allows me to determine, is as follows:

H. brunneicapillus.—Southern border of the United States from southwestern Utah and southern California to Sonora, Mexico, and possibly to the lower Rio Grande, and the states of Nuevo Leon, and Tamaulipas, Mexico

H. brunneicapillus obscurus.—Tableland of Mexico from near northern boundary to the Valley of Mexico and northern Puebla. This range includes all or a large part of the states of Mexico, Hidalgo, Michoacan (northern portion), Queretaro, Guanajuato, Jalisco, Zacatecas, Aguas Calientes, San Luis Potosi, Durango, Chihuahua, and Coahuila.

Several specimens in the series from the southwestern United States, representing true *brunneicapillus*, as well as others from the region occupied by *obscurus*, have a buffy suffusion extending over the upper part of the breast and becoming gradually deeper in shade thence back to the flanks. This appears to be merely a high condition of plumage.

Vireo nanus sp. nov. Dwarf Vireo.

Type No. 144890, U. S. Nat. Mus., Biological Survey Coll. Ad. ♂, Querendaro, Michoacan, Mexico, Aug. 9, 1892. Collected by E. W. Nelson.

Distribution.—Southern border of the Mexican tableland, in Michoacan.

Description of type.—Entire dorsal surface grayish olive-green, becoming browner on head and shoulders and greener on rump and upper tail coverts. Wings and tail blackish-brown, outer borders of feathers edged with olive-green; lores and superciliary stripe grayish-white; ear coverts and sides of neck olive-gray. Lower parts white with a faint grayish shade across breast. Two narrow wing bars formed by white edges to primary and secondary coverts; first primary half the length of second; fourth primary longest; tail about four-fifths the length of wing; bill black; legs and toes blackish. Wing 54; tail 43; culmen 10; tarsus 17.

The type and only known specimen of this bird is in badly worn summer plumage. The perfect plumage is probably clearer green than shown by the type. The bill is more slender and terete than in any species of Vireo known to me, and is not typically vireonine in this character; otherwise the bird seems to belong in the genus where it is placed.

Progne sinaloæ sp. nov. Sinaloa Martin.

Type No. 157171, U. S. Nat. Mus., Biological Survey Coll. Ad. ♂, Plomosas, Sinaloa, Mexico, July 18, 1897. Collected by E. W. Nelson and E. A. Goldman.

Distribution.—Western slope of the Sierra Madre, Sinaloa (between 2500 and 4000 feet alt.).

Description of adult male.—Entire head, neck, breast, flanks, and dorsal surface uniformly glossy blue-black, thinly overlaid with wash of glossy black formed by black edges of feathers; chest, abdomen, under tail coverts, and concealed spot on each side of back pure white. Wings and tail black.

Dimensions of type.—Wing 136; tail 71; culmen 10; tarsus 12.5; depth of fork of tail 20.

Averages of 4 males: wing 134.2; tail 72; culmen 11.1; tarsus 13.2; depth of fork of tail 18.2.

Averages of 4 males of *Progne dominicensis* (from West Indies): wing 144.5; tail 75; culmen 11.9; tarsus 15.1; depth of fork of tail 20.5.

P. dominicensis (Gmel.) of the West Indies is the only species with which *P. sinaloæ* need be compared. The latter may be distinguished by its smaller size, pure white under tail coverts, glossy black tips of feathers on dorsal surface (overlying the glossy blue-black of general color), and the steel-blue-black as contrasted with the decidedly purplish-blue-black of *dominicensis*. The general appearance of the two species is very similar.

We found *P. sinaloæ* at an altitude of about 3500 feet on the western slope of the Sierra Madre in Sinaloa. They were seen in only one place, at the upper border of the tropical zone about the point of a ridge facing the hot lowlands. A flock of from twenty to thirty passed several hours each day, circling about the hillslope in pursuit of insects. The flock was made up entirely of males and no females were seen. A native hunter living near the place where the birds were found told me that they occur at this point throughout the year. He could give no information about their nesting haunts, which were probably not far from this place. We looked for them without success when we went into the same mountain a little farther to the south.

It was unexpected to find in northwestern Mexico a species so like the West Indian one and so different from the two species of the genus which range over the mainland of central and eastern Mexico.

Phœnicothraupis rubicoides roseus subsp. nov. Rosy Tanager.

Type No. 156121, U. S. Nat. Mus., Biological Survey Coll. Ad. ♂, Arroyo de Juan Sanchez (50 miles north of Ixtapa, Jalisco), Territory of Tepic, Mexico, April 5, 1897. Collected by E. W. Nelson and E. A. Goldman.

Distribution.—Basal slopes of mountains in western Tepic and Jalisco, Mexico.

Description of type.—Crown rich dark vermilion-red, bordered along the sides by black; forehead, sides of head, neck, and remainder of dorsal surface dull red with a wash of rose color; wing feathers dark brown bordered externally with same color as back; tail dull red. Entire under surface dull rose-red, deepest on throat and breast, lightest and clearest on abdomen and crissum; flanks washed with brown. Dimensions of type: wing 92; tail 87; culmen 18; tarsus 26.

In general the male of this bird has the rosy color of a pale specimen of *Phœnicothraupis rubra*, very different from the brick-red of typical *P. rubicoides*. It is nearer *P. rubicoides affinis*, from which the male is distinguishable by its paler colors. The crest differs also in being a deeper, more brilliant red than in either of the two other forms. The female of *P. r. roseus*, compared with those of *P. rubicoides* and *P. r. affinis*, has a more olive-green back with little trace of the brown so characteristic of the others; the yellow crest is much less strongly marked and has but

slight traces of a blackish border; the under surface is olive-brown, of a much clearer or greener shade. It is decidedly smaller with much smaller bill.

Contrasted with typical *rubicoides*, this form is very different, but our series of specimens from various localities in Vera Cruz, and thence through the Isthmus of Tehuantepec and up the west coast to Jalisco, show that it is merely a geographical race of that species.

Amphispiza bilineata grisea subsp. nov. Mexican Black-throated Sparrow.

Type No. 136006, U. S. Nat. Mus., Biological Survey Coll. ad. ♂, Tula, Hidalgo, Mexico, March 9, 1893. Collected by E. W. Nelson.

Distribution.—Southern part of Mexican tableland from northern San Luis Potosi to northern end of Valley of Mexico.

Differs from typical *A. bilineata* in larger size, proportionately shorter bill and tarsus, darker and grayer dorsal surface, and smaller white areas on ends of tail feathers.

Averages of typical *Amphispiza bilineata* (southern Texas and northeastern Mexico):

Ad. ♂ (5 specimens): wing 64.4; tail 57.8; culmen 10.6; tarsus 18.9.
" ♀ (2 "): " 62; " 57; " 10.7; " 19.

Averages of *A. bilineata grisea* (San Luis Potosi and Hidalgo):

Ad. ♂ (8 specimens): wing 69.1; tail 63.4; culmen 10.5; tarsus 19.
" ♀ (3 "): " 66.6; " 60.6; " 10.8; " 19.

The present race inhabits a region in which the species was previously unknown, thus leaving it without definite synonymy. The following citations, however, might be doubtfully referred to it:

Poospiza bilineata (*nec* Sclater, 1850) Sel., Cat. Am. Birds, 110, 1862 (Mexico); Sel. and Salv. Nom. Av. Neotrop., 30 part (Mexico), 1873.

Guiraca chiapensis sp. nov. Chiapas Grosbeak.

Type No. 144319, U. S. Nat. Mus., Biological Survey Coll. Ad. ♀, Ocozocuautla, Chiapas, Mexico, August 19, 1895. Collected by E. W. Nelson and E. A. Goldman.

Distribution.—The type and only known specimen was taken on the low tableland of western Chiapas at an altitude of about 3000 feet.

Description of type.—Entire dorsal surface dark brown, upper tail coverts shaded with grayish; feathers of back darkest along shafts with narrow, indistinct edging of lighter brown; top of head and neck nearly uniform dark brown with distinct gloss of blue; this blue gloss is faintly visible also on sides of neck and shoulders. Wings slightly darker brown than back and crossed by two bands of dull buffy formed by narrow tips to greater and lesser coverts; the band on lesser coverts broadest. Ear coverts and cheeks dark, dingy buffy-brown; feathers on middle of chin

and throat whitish at base and dull buffy on outer half; feathers on sides of chin, throat, and under surface of neck and breast dull brownish with dingy buffy edges. Rest of lower parts much lighter, the feathers with dark shaft lines and bordered along edges by pale grayish and buffy. Dimensions: Wing 90; tail 72; culmen 21; greatest depth of bill 16; greatest width of under mandible 14; tarsus 23.

Average dimensions of four adult females of *Guiraca cærulea eurhyncha* (from central and southern Mexico): wing 87.5; tail 67; culmen 17.2; greatest depth of bill 12.9; greatest width of under mandible 11.2; tarsus 21.5.

Averages of four adult females of *Guiraca c. eurhyncha* (from southern Arizona): wing 84.5; tail 65.2; culmen 16.9; greatest depth of bill 13.1; greatest width of under mandible 11; tarsus 21.4.

The type of *G. chiapensis* is in worn breeding plumage and is very similar in color to a female of *eurhyncha* taken at the same season in southern Arizona, but may be distinguished at once by its huge bill, as shown in the accompanying figure (fig. 14 *a*); it is lighter and less buffy on lower parts, particularly on breast and neck. This species is probably a resident of central Chiapas and perhaps bears the same relationship to *Guiraca eurhyncha* in size and range that *Passerina sumichrasti* does to *P. parellina*.

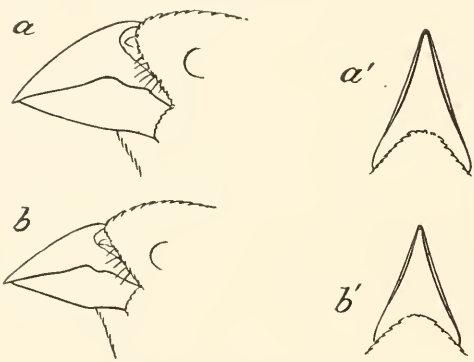

Fig. 14.—*a*, *Guiraca chiapensis*. *b*, *Guiraca cærulea eurhyncha*.

In the district where the type of *G. chiapensis* was taken, Blue Grosbeaks were common and probably were all or nearly all of this species. Unfortunately, not having distinguished the latter from *eurhyncha* at the time of our visit, we failed to secure other specimens.

Grallaria ochraceiventris sp. nov. Buff-bellied Ant Thrush.

Type No. 156013, U. S. Nat. Mus., Biological Survey Coll. Ad. ♂, San Sebastian, Jalisco, Mexico, March 16, 1897. Collected by E. W. Nelson and E. A. Goldman.

Distribution.—Heavy forests in western Jalisco, and perhaps elsewhere in western Mexico north of Tehuantepec.

Description of type.—Feathers of crown and back olive-brown, shaded with fulvous, and narrowly margined with black; sides of crown, back of orbits, and nape olive-brown with a dark ashy shade most marked on sides of crown; forehead paler or more fulvous brown. Tertiaries and secondaries dull rusty brown; outer vanes of primaries shading from dull

rusty brown to dull tawny brown on outer quills; wing coverts dull brown with shaft lines and spots of dull tawny brown at tips. Under coverts and axillars pale buffy; inner webs of quills at base still paler buffy, becoming grayish brown on outer half; tail and upper tail coverts light rusty brown. Lores and malar patch pale, dull grayish-white, shaded with dingy fulvous; under eyelids blackish; ear coverts dark olive-brown washed with blackish; chin, throat, and patch on middle of breast whitish washed with fulvous; feathers bordering breast-patch scantily black tipped; sides of throat, breast (except whitish patch), chest, and flanks dingy buffy. Abdomen pale buffy, crissum darker, richer buffy.

Dimensions of type.—Wing 114; tail 43; culmen 28; tarsus 47.

This species is most like *G. mexicana*, from which it is distinguishable by its generally paler colors; obsolescence of ashy on crown and nape; much scantier black margins to feathers on dorsal surface, and shorter tarsus.

Amazilia cinnamomea saturata subsp. nov. Chiapas Humming Bird.

Type No. 155297, U. S. Nat. Mus. Biological Survey Coll. Ad. ♂, Huehuetan, Chiapas, Mexico, March 2, 1896. Collected by E. W. Nelson and E. A. Goldman.

Distribution.—Heavily forested foothills on Pacific coast of Chiapas, near border of Guatemala.

Description.—Back and wing coverts dark coppery bronze; wings dark purplish; entire lower parts rich dark cinnamon, approaching chestnut, throat a little paler; tail very dark chestnut with broad tips of dark bronze.

Measurements of type.—Wing 55; tail 36; culmen 22.5.

The following average measurements show the relative sizes of *Amazilia cinnamomea* from western Mexico, north of Tehuantepec, and the new form:

A. cinnamomea, adult ♂ (7 specimens): wing 57.9; tail 36.6; culmen 22.

A. c. saturata, adult ♂ (3 specimens from Huehuetan, Chiapas): wing 55; tail 35; culmen 22.3.

This form differs from typical *cinnamomea* mainly in its much darker or more intense colors; its wings and tail are a little shorter, and the bill is proportionately longer.

At first I was inclined to consider this bird *Trochilus corallirostris* Bourc. and Muls. (Ann. Sci. Phys. et Nat., Lyons, IX, p. 328, 1846), which was described from a specimen taken at Escuintla, Guatemala. Upon looking the matter up, however, I find that Mr. Elliot described the type of *T. corallirostris* in his Synopsis of the Humming Birds (p. 119) under *Amazilia cinnamomea*. The measurements of Bourcier's type, as given by Elliot and reduced to millimeters, are as follows: Wing 57.1; tail 44.5; culmen 22.2. These measurements indicate that it is true *cinnamomea*. The discrepancy in the length of the tail compared with my averages is due to a difference in methods of measuring. The series of true *A. cinnamomea* contains specimens from various localities in western Mexico between Mazatlan

and Tehuantepec; also from Yucatan, Honduras, Salvador, and Nicaragua. Throughout this wide range the species holds its characters with surprisingly little variation. *A. cinnamomea* inhabits areas overgrown with scrubby forest of an arid tropical character. *A. c. saturata* was found in the borders of the great humid tropical forests of the foothills in southern Chiapas, and probably ranges along the slopes of these mountains into western Guatemala. A single specimen from Tehuantepec is intermediate between true *cinnamomea* and *saturata*, upon the strength of which I have given the present bird subspecific rank.

Revision of the genus DACTYLORTYX Ogilvie-Grant.

Dactylortyx Ogilvie-Grant, Cat. Birds Brit. Mus., XXII, 429, 1893. Type *Ortyx thoracicus* Gambel.

In the Proceedings of the Philadelphia Academy of Sciences for 1848 (vol. IV, p. 77), Dr. Gambel described *Ortyx thoracicus* from a specimen obtained by Mr. Pease at Jalapa, Vera Cruz, Mexico. In 1850 Mr. Gould published his *Odontophorus lineolatus*, giving a colored figure of both sexes and a description of the female (Mon. Odont. III, pl. 32, with text, 1850). Gould's figures and description were based on a pair of birds in the Berlin Museum, labeled by Lichtenstein with the unpublished name *Perdix lineolata*. These birds came from Mexico without any definite locality, and Gould considered them identical with Gambel's species, but used Lichtenstein's manuscript name. In 1893 Ogilvie-Grant made the genus *Dactylortyx* to receive the birds described by Gambel and Gould, which he considered identical and called *Dactylortyx thoracicus*. He gave the range of *D. thoracicus* as 'Central America; southern Mexico, Yucatan, Guatemala, and San Salvador.' There is good reason to doubt that any species of grouse or partridge ranges over this area. The material at hand proves that Ogilvie-Grant's *D. thoracicus* is a composite species including several distinct birds.

Through the courtesy of Mr. Witmer Stone, Conservator of the Ornithological Section of the Philadelphia Academy of Natural Sciences, I have examined two specimens of true *D. thoracicus* from Jalapa, Mexico, one of which is Dr. Gambel's type. Unfortunately both are females and I have no male of the typical form to compare with the males of the others recognized below. The amount of individual variation does not appear to be great, judging from the two specimens of *D. thoracicus* and four specimens of the species in Chiapas and Guatemala, here described as *D. chiapensis*. After comparing the two typical specimens of *D. thoracicus* (Gambel) with Gould's plate and description of the female of his *O. lineolatus*, I am satisfied that they represent birds which are at least subspecifically distinct. The left-hand figure in Gould's plate represents a male and agrees very closely with a specimen in the U. S. National Museum, obtained by Mr. Sumichrast on the Gineta Mt., near Santa Efigenia, Oaxaca. This place is on the Pacific slope of Mexico near the border of Chiapas and gives a definite locality for the birds of this form. The species and subspecies recognizable in the material before me may be briefly characterized as follows:

Dactylortyx thoracicus (Gambel). Male unknown.

Female: Breast and flanks light rufous with shafts of feathers distinctly lighter, but with no definite shaft lines. Feathers of rump with heavy black cross-bars.

D. thoracicus lineolatus (Gould). Male: Breast and flanks ash-gray faintly washed posteriorly with buffy, and with broad well-marked white shaft lines.

Female: Similar to typical *thoracicus*, but breast and flanks with well-marked pale shaft lines.

D. chiapensis sp. nov. Male: Breast and flanks dark plumbeous-gray; feathers with narrow bright white shaft lines and indistinctly edged and barred with brown and blackish.

Female: Breast and flanks dark, dingy brownish-red washed with ashy on flanks; feathers with pale narrow shaft lines; no black bars on rump.

D. devius sp. nov. Male: Breast feathers dull ashy, broadly bordered with dull rufous and with fine white shaft lines. Flanks dull rufous with fine black mottling and wash of dull fulvous.

Female: Unknown.

Dactylortyx thoracicus (Gambel). Jalapa Partridge.

Ortyx thoracicus Gambel, Proc. Acad. Nat. Sci. Phila., IV, p. 77 (1848).
Odontophorus lineolatus Gray, List Gallinæ Brit. Mus., p. 73, 1867 (part, Cordova).
Dactylortyx thoracicus Ogilvie-Grant, Cat. Birds Brit. Mus., XXII, p. 429, 1893 (part).

Distribution.—Mountain slopes of eastern Mexico (north of Isthmus of Tehuantepec?).

Description of type.—No. 12404, Coll. Phila. Acad. Sciences, ad. ♀, Jalapa, Vera Cruz, Mexico. Collected by Mr. Pease.

Entire top of head blackish, variegated indistinctly with dark rufous and with paler shaft streaks which are dull rufous posteriorly. Feathers on back of neck dull rufous, heavily overlaid with black tips and bars; feathers of mantle with ashy centers and heavy borders of dark rufous brown, finely and indistinctly mottled with blackish. Scapulars with pale golden-buffy shaft streaks, lower webs pale ashy variegated and bordered with black and dark buffy, upper webs black, variegated with chestnut. Rump and upper tail coverts olivaceous brown, paler and more buffy on rump and darker brown on coverts; entire rump and upper tail coverts heavily barred and marked with black; tertials dark chestnut, handsomely variegated with black, and with black borders below and dark buffy borders above; wing coverts marked much as scapulars, but darker on lower webs. Primaries dark gray with dull buffy mottling along outer webs; secondaries dark gray, slightly mottled on inner and heavily mottled on outer webs with blackish, dull rufous and buffy. Tail dingy blackish variegated with buffy and dull rusty. Chin and throat whitish with wash of ashy and faint edging of blackish; sides of head with ear covers and superciliary stripe dark ashy. Sides of neck, breast all round, and flanks bright rufous, shafts of feathers a little paler. Feathers on

sides of head and neck, including ear coverts, finely tipped or barred with black. Abdomen white; under tail coverts dark fulvous with heavy black subterminal markings.

The other female from Jalapa is similarly colored in every particular except on mantle where the rufous borders of feathers are duller and the gray centers more conspicuous.

The dimensions of these specimens are as follows: No. 12404, ♀ (type of species), wing 128; tail 48; culmen 14; tarsus 34. No. 12405, ♀ (topotype), wing 135; tail 50; culmen 14; tarsus 35.

Dactylortyx thoracicus lineolatus (Gould). Striped Partridge.

Odontophorus lineolatus Gray, Genera of Birds, III, p. 513 (1847), nomen nudum; Gould (*Perdix lineolata*, Licht. MS. in Mus. Berl). Mon. Odont. III, pl. 32, with text (1850); Bon., Compt. Rend., XLII, p. 883 (1856).
Strophiortyx lineolatus Gray, Hand List Birds, II, 272 (1870).
Dactylortyx thoracicus Ogilvie-Grant, Cat. Birds Brit. Mus., XXII, p. 429, 1893 (part).

Distribution.—Mountain slopes of southwestern Oaxaca and adjacent part of Chiapas.

Description of adult male.—(No. 116338, U. S. Nat. Mus. Santa Efigenia, Oaxaca, Mexico, Nov., 1880. Collected by F. Sumichrast). Lower neck, breast, and flanks gray with faint wash of buffy-brown anteriorly, becoming heavier along flanks; feathers marked with broad white shaft streaks. Crown dark brown with very fine shaft lines of pale buffy; nape feathers streaked with broad buffy shaft lines and black borders; feathers of mantle with narrow white shaft streaks and gray webs, mottled with dull chestnut and black along borders. Scapulars, tertials, and wing coverts with shaft lines of white or pale buffy; upper webs of these feathers irregularly mottled and barred with black and rich chestnut; lower webs grayish with wash of brown and marked with black lines along borders. Primaries and secondaries dark gray mottled with buffy along borders of primaries; secondaries more distinctly mottled and barred with buffy and blackish on outer webs. Back, rump, and upper tail coverts nearly uniform buffy-brown with fine dark mottling. Tail dark gray with blackish and buffy mottling in irregular cross-bars

Dimensions: Wing 132; tail 55; culmen 14; tarsus 35.

Dactylortyx chiapensis sp. nov. Chiapas Partridge.

Odontophorus thoracicus Scl. & Salv., Ibis, p. 276, 1860 (Volcan de Fuego, Guatemala). ?
Odontophorus lineolatus Gray, List Gallinæ Brit. Mus., p. 73, 1867 (part, Guatemala).
Dactylortyx thoracicus Ogilvie-Grant, Cat. Birds Brit. Mus, XXII, p. 429, 1893 (part).

Type No. 155539, U. S. Nat. Mus., Biological Survey Coll. Ad. ♂, San Cristobal, Chiapas, Mexico, Sept. 25, 1895. Collected by E. W. Nelson and E. A. Goldman.

Description of type.—Crown and nape mottled with black and dark chestnut; feathers on mantle with fine whitish shaft lines; webs grayish next shaft lines and shading outwardly into fine black mottling and then into a wash of dark vandyke-brown, deepest on borders. Back mottled with dull buffy-gray and blackish, former color predominating anteriorly; rump and upper tail coverts dark gray mottled with buffy and blackish, heaviest on tail coverts where some feathers have heavy shaft spots or lines. Tail blackish with irregular bars of grayish and buffy mottling. Scapulars, tertials, and wing coverts with bright narrow shaft lines of pale buffy; upper webs of scapulars and wing coverts heavily marked with transverse bands of black and dark reddish-brown, lower webs gray with irregular brown and black lines along edges; tertials rich reddish-brown mottled with blackish and broadly bordered with black and edged with a golden-buffy line. Primaries and secondaries gray, former with pale buffy spots along outer webs; latter barred irregularly with brown and buffy mottling. A broad superciliary stripe of rufous-buffy extends from bill to sides of nape, palest posteriorly. Ear coverts mottled black and brown; lores white; some feathers of lores and line below eyes tipped with black; feathers on sides of neck, just back of ear coverts, heavily tipped with black; chin, throat, and cheeks rich reddish-buffy. Lower neck, breast, and flanks gray with wash of dull olive-brown on edges of feathers and heaviest on flanks; the feathers have fine, sharply defined white shaft lines with transverse series of fine dark mottlings. Chest and abdomen white; feathers of under tail coverts buff with heavy, irregular dark bars and mottlings on basal two-thirds.

Dimensions.—Wing 129; tail 49; culmen 14; tarsus 36.

Description of female.—Differs from male in having the rufous and rufous-buff areas on head replaced by dark ashy-gray, and the gray area on breast and flanks replaced by rufous. Crown, dark grayish-brown, finely mottled with black and faint traces of rufous; feathers of nape black, barred subterminally with dark reddish-brown; a broad gray superciliary stripe terminates in a buffy line on each side of nape; ear coverts black in front, gray posteriorly. Feathers on hind neck gray and dull rufous-brown with whitish shafts and black spots near tips. Mantle with paler shade of gray and buffy markings. Pattern on scapulars, tertials, and wing coverts similar, but the brown decidedly redder and more pronounced. Back, rump, and upper tail coverts very similar, but tail coverts richer buffy with heavier black centers. Tail black, irregularly mottled transversely with gray, rufous, and buff. Chin and throat ashy, feathers black-tipped on sides of throat. Sides and lower part of neck, breast, and flanks marked with fine pale shaft streaks; general color of this area dull reddish-brown, richest on sides of neck and breast, duller and grayer posteriorly. Middle of chest and abdomen pale buffy; under tail coverts buffy, with heavy black markings. Dimensions: Wing 130; tail 45; culmen 13.5; tarsus 34.

A female from the Volcano of Santa Maria, Guatemala, is very similar to the one from San Cristobal, but is a trifle more rufous, with abdomen pure white and lower webs of scapulars and wing coverts brown and

buffy instead of brown and ashy as on the bird just described. Dimensions: Wing 132; tail 50; culmen 14; tarsus 34.

Dactylortyx devius sp. nov. Brown-flanked Partridge.

Dactylortyx thoracicus Ogilvie-Grant, Cat. Birds Brit. Mus., XXII, p. 429, 1893 (part).

Type No. 155938, U. S. Nat. Mus., Biological Survey Coll. Ad. ♂, San Sebastian, Jalisco, Mexico, March 17, 1897. Collected by E. W. Nelson and E. A. Goldman.

Distribution.—Forests of western Jalisco, and probably other parts of western Mexico.

Description of type.—Middle of crown and nape dark chestnut-brown with blackish mottling; back of neck mottled coarsely with black and dark rufous; broad superciliary stripe from bill to nape dark buffy, continued on sides of nape by broad buffy-whitish shaft streaks on feathers bordered by black and dark rufous. Lores gray with fine black tips; chin, throat, and cheeks rich rufous-buffy; feathers from lores back under eye and along sides of neck tipped with black; ear coverts brown with pale shafts and dark tips. Feathers of hind neck and mantle with brownish gray centers, bordered with dark rufous-brown and finely mottled with black; scapulars finely barred with dark rufous-brown and edged with black; back rump and upper tail coverts grayish brown, finely mottled with buffy and blackish, the gray clearest on back; the buffy and dark mottling becomes gradually more intense posteriorily and the tail coverts are almost rufous. Tail blackish, finely mottled with brown, dark buffy and gray. Scapulars, tertials, and wing coverts with narrow, pale, buffy shaft streaks; upper webs black, barred and mottled with rufous; lower webs light gray, mottled with darker near shafts and black and brown near borders. Primaries dark gray with pale buffy spots along outer web; secondaries blackish, irregularly barred with buffy-brown mottlings on outer webs and across tips. Lower neck, breast, and flanks with fine white shaft lines. Webs of feathers on neck and middle of breast gray next shaft lines, shading externally into dull reddish-brown; same pattern on sides of breast and flanks, but reddish-brown more intense and spread over most of feathers. Chest and sides of abdomen buffy; middle of abdomen white; under tail coverts black, broadly tipped and mottled with dark buffy.

Dimensions: Wing 137; tail 57; culmen 15; tarsus 34.

Female unknown.

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PROCEEDINGS

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BIOLOGICAL SOCIETY OF WASHINGTON

SMITHSONIAN BIOLOGICAL SERIES

DESCRIPTIONS OF SIX NEW GROUND SQUIRRELS FROM THE WESTERN UNITED STATES.

BY C. HART MERRIAM.

Of the six new Spermophiles here described, one (*oregonus*) belongs to the *armatus-beldingi* group, three are subspecies of *mollis*, and two subspecies of *tridecemlineatus*.

Spermophilus oregonus sp. nov.

Type from Swan Lake Valley, Klamath Basin, Oregon. No. 89177, ♀ ad., U. S. Nat. Mus., Biological Survey Coll., June 12, 1897. Collected by Vernon Bailey. Orig. No. 6005.

Characters.—Similar to *S. beldingi* in size and general characters but *grayer* and lacking the red dorsal area and head patch. Similar to *S. armatus* in color of upper parts, but under side of tail chestnut instead of grizzled gray and black.

Color.—Upper parts buffy-gray, grizzled with black hairs, sometimes becoming pale dull buffy-fulvous on middle of back; under parts buffy or buffy-yellowish, the dark basal fur showing through; nose sometimes pale buffy-fulvous; feet buffy-whitish; tail above: basally like back, distally becoming grizzled black and fulvous, with black tip and edged all round with hoary; tail below: deep chestnut bordered with black and edged with hoary, the black border forming a broad band across end.

Cranial characters.—Skull like that of *S. beldingi* but rostrum more slender, ascending arms of premaxillæ narrower, palate longer behind molars, palatine bones shorter anteriorly, reaching only to plane of middle of 2d molars [in *beldingi* they reach plane of interspace between 1st and 2d molars].

Measurements.—Type specimen: Total length 265; tail vertebræ 57; hind foot 42.

Spermophilus mollis stephensi subsp. nov.

Type from Queen Station, near head of Owens Valley, Nevada. No. $\frac{2}{4}\frac{2}{1}\frac{4}{5}\frac{9}{6}\frac{2}{7}$, ♂ ad., July 12, 1891. Collected by F. Stephens. Orig. No. 718. (Alt. about 6000 ft.)

Characters.—Similar to *S. mollis*, but in summer pelage head and neck to shoulders uniform pinkish buff [of Ridgway's Color Nomenclature].

Color.—Summer pelage: Entire head and neck and fore-back to shoulders uniform pinkish-buff, becoming yellowish-buff below; rest of back vinaceous-buff slightly mixed with brown; under parts and fore legs and feet buffy; hind feet soiled whitish; tail above and below buffy, grizzled with dark hairs and edged with buffy.

Cranial characters.—Skull like that of *mollis*, but braincase broader across mastoids; ascending arms of premaxillæ narrower and more pointed; tooth row shorter.

Measurements.—Type specimen: Total length 209; tail vertebræ 49; hind foot 32. Average of 9 specimens from Owens Valley, Calif.: Total length 212; tail vertebræ 50; hind foot 32.4.

Spermophilus mollis yakimensis subsp. nov.

Type from Mabton, Yakima Co., Washington. No. 89331, ♂ ad., U. S. Nat. Mus., Biological Survey Coll., July 16, 1897. Collected by Walter K. Fisher. Orig. No. 323.

Characters.—Similar to *S. mollis* in size and general appearance, but tail slightly shorter; color grayer and less buffy, but not so gray as *canus*. Nasal bones very much longer than in either *mollis* or *canus*.

Color.—Upper parts buffy-gray, finely grizzled with dusky; nose dull rusty fulvous; cheeks and sides of neck grayish, sometimes suffused with pale buffy-yellowish, but never approaching the strong buffy-ochraceous of *mollis;* under parts buffy; feet whitish; tail grizzled fulvous as in *mollis*.

Cranial characters.—Skull like that of *mollis* in size and general characters, but nasal bones much longer, passing backward considerably beyond premaxillæ and ending in a wedge-shaped point; audital bullæ more inflated below plane of meatus (*i. e.*, less flattened); basioccipital slightly broader; incisors heavier.

Measurements.—Type specimen: Total length 215; tail vertebræ 48; hind foot 33. Average of 10 specimens from type locality and adjacent plain: Total length 213; tail vertebræ 46; hind foot 34.2.

Spermophilus mollis canus subsp. nov.

Type from Antelope, Wasco Co., Oregon. No. 78681, ♀ ad., U. S. Nat. Mus., Biological Survey Coll., June 21, 1896. Collected by Vernon Bailey. Original No. 5561.

Characters.—Similar to *S. mollis*, but grayer, slightly smaller, with shorter hind feet and decidedly shorter tail; skull smaller and relatively broader, with much shorter rostrum.

Color.—Upper parts finely grizzled gray and dusky without buffy suffusion; nose dull rusty fulvous; cheeks and sides of neck grayish (not buffy-ochraceous as in *mollis*); thighs dark, with a dull fulvous suffusion very different from the pale buffy-ochraceous of *mollis;* under parts buffy or buffy-gray, more or less grizzled with dark hairs on breast and middle

of belly; feet soiled whitish; tail grayer and less fulvous than in *mollis*. Young similar to young of *mollis*, but decidedly darker; head and neck pale dull-fulvous instead of buffy-ochraceous; tail strikingly shorter and darker.

Cranial characters.—Skull similar to that of *mollis*, but shorter and relatively broader; rostrum conspicuously shorter; molariform teeth smaller (tooth row 1 mm. shorter); nasals shorter but variable, usually ending behind plane of premaxillæ.

Measurements.—Type specimen: Total length 198; tail vertebræ 38; hind foot 30. Average of 3 specimens from type locality: Total length 194.3; tail vertebræ 40; hind foot 30.3.

Spermophilus tridecemlineatus alleni * subsp. nov.

Type from Bighorn Mts., Wyoming. No. 56050, ♂, U. S. Nat. Mus., Biological Survey Coll., Sept. 18, 1893. Collected by Vernon Bailey. Original No. 4383.

Characters.—Size small (nearly as small as *parvus*); ground color of upper parts fully as dark as in typical *tridecemlineatus;* light spots in dorsal rows relatively larger and tail darker and much less reddish than in *tridecemlineatus*.

Cranial characters.—Skull and teeth similar to those of *parvus* (perhaps very slightly larger), but audital bullæ very much smaller.

Measurements.—Type specimen: Total length 211; tail vertebræ 74; hind foot 32.

Spermophilus tridecemlineatus texensis subsp. nov.

Type from Gainesville, Cooke Co., Texas. No. $\frac{21147}{26477}$, ♂ ad., Merriam collection, April 15, 1886. Collected by G. H. Ragsdale.

Characters.—Similar to *S. tridecemlineatus*, but smaller; ground color of upper parts, including base of tail, redder; middle stripe of under side of tail uniform deep reddish, not grizzled with black; no yellowish-olive tinge in any pelage and less seasonal difference in color than in any of the other forms.

Color.—*Winter pelage:* Ground color of upper parts, including base of tail, rich deep ferruginous or rusty, slightly grizzled with black hairs; nose grayish, slightly grizzled with rusty; sides of neck, feet, and under parts buffy; head marblings, dorsal stripes and spots, chin and lips buffy-white; rusty under side of tail sometimes partly hidden by buffy tips. *Summer pelage:* Similar to winter pelage, but ground color duller and light stripes and spots more buffy.

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* In honor of Dr. J. A. Allen, who first defined and named the subgenus *Ictidomys* to which the *tridecemlineatus* group belongs, and to whom we are indebted for its two best marked members—*pallidus* and *parvus*.

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PROCEEDINGS

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DESCRIPTION OF A NEW RODENT OF THE GENUS *IDIURUS*.*

BY GERRIT S. MILLER, JR.

Among some African birds recently purchased by the United States National Museum were found a few mammal skins from Efulen, in the Cameroon district. Two of these are referable to the rodent genus described by Mr. Paul Matschie under the name *Idiurus*.† Although taken within seventy miles of Yaunde Station, the type locality of *Idiurus zenkeri*, these specimens are referable to a species quite distinct from the one represented by Mr. Matschie's unique type. The new form may be called:

Idiurus macrotis sp. nov.

Type No. 83625, United States National Museum, ♂ young adult, collected at Efulen, Cameroon district, West Africa, June 18, 1895, by G. L. Bates. Original No. 4.

General characters.—Much larger than *Idiurus zenkeri* Matschie; tail and ears relatively longer; color apparently darker; skull larger; bony palate narrower; second lower molar distinctly larger than first.

Fur and color.—Pelage formed of hairs of two kinds. Main body of fur composed of soft densely set hairs about 9 mm. in length. Interspersed with these are hairs about double as long and closely resembling those of the wrist and foot tufts. These hairs occur on the dorsal surface only, and are most numerous along the sides. Dorsal surface of membranes covered with fur somewhat less dense than that on body; extreme edges of membranes bare. Ventral surface of membranes very sparsely haired. Distribution of hair on tail and feet exactly as described in *I. zenkeri*.

* Published by permission of the Secretary of the Smithsonian Institution.

† Sitzungs-Berichte Gesellschaft Naturforschender Freunde zu Berlin, 1894, p. 194.

Color above sepia, slightly grayer on posterior half of back, and darkening to nearly black on membranes. A faintly indicated dark stripe from base of ear to muzzle. This is perceptible in certain lights only. Throughout the body fur the hairs are dusky plumbeous to within about 1 mm. of tip. This darker color appears everywhere irregularly at the surface. Ventral surface pale yellowish wood brown, irregularly darkened by the plumbeous bases of the hairs. Hairs on under side of membranes very dark brown and with none of the silver gray appearance described in *I. zenkeri*. Dorsum of manus and pes with short, scattered, dark brown hairs. Fringe on wrist (fig. 15) and side of hind foot dark brown. Tail dark chestnut brown, slightly tinged with yellowish near base.

Fig. 15.—Front foot of *Idiurus macrotis*. (× 1⅛.)

Feet.—So far as can be determined from dry specimens, the feet are essentially as in *Idiurus zenkeri*. The front foot with its equal digits, rudimentary thumb, and fringed wrist is shown in figure 15.

Tail.—The generic characters of the tail, as described by Mr. Matschie in the type of *Idiurus zenkeri*, are exactly reproduced in *I. macrotis* (fig. 16). The pad of projecting scales occupies a space about 17 mm. in length and 4 mm. in width. The proximal end of the pad is about 25 mm. behind the anus. The lateral fringes begin on each side of the proximal end of the scale pad, but the ventral fringe reaches only to a point about 15 mm. behind the pad. The three fringes continue distinct to near the tip of the tail, where the hairs of which they are composed gradually become longer and finally blend with the long sparse hairs of the dorsal surface to form the terminal pencil. The hairs of all three fringes are about 4 mm. in length, those of the ventral fringe closely appressed. Long hairs on dorsal surface of tail 30–45 mm. in length.

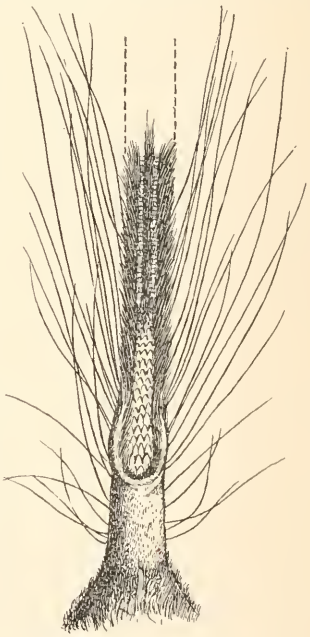

Fig. 16.—Base of tail (under side) of *Idiurus macrotis*. (× 1⅛.)

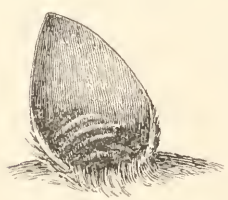

Fig. 17.—Ear of *Idiurus macrotis*. (× 1⅛.)

Ear.—The ears (fig. 17) are much larger than in *I. zenkeri* and wholly naked both within and without, except on the external basal third, which is covered with fur similar to that of the head. With a lens a few very small hairs may be detected on the anterior border, but these are invisible to the unaided eye. In form the ear is very simple and strongly suggestive of that of

some of the smaller bats. Near the base of the auricle on the inner side are three well developed cross-ridges, and a fourth which is less distinct.

Skull.—The skull (fig. 18) is in general similar to that of *Idiurus zenkeri*. The bony palate, however, is at its widest point scarcely wider than the first molar, while at its narrowest point it is decidedly narrower than this tooth. In *I. zenkeri* the palate is about double as wide as the tooth row.* Surface of frontals slightly and evenly convex, with scarcely a trace of the six protuberances mentioned in the description of *I. zenkeri*; orbital edges knife-like and slightly overhanging. Incisive foramen a narrow slit, 1 mm. long and about one-third as wide.

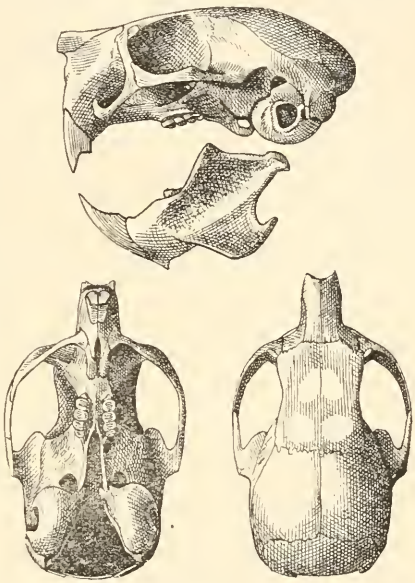

Fig. 18.—Skull of *Idiurus macrotis*. ($\times 1\frac{1}{2}$).

Mandible very short and deep, the greatest depth contained only one and one-half times in greatest length. Coronoid process joined with articular process by a thick bridge, below which the bone is thin and semitransparent, but not fenestrate as in the type of *I. zenkeri*.†

Teeth.—Upper molar rows slightly convergent anteriorly. Combined length of three true molars equal to antero-posterior diameter of incisor. Premolar about three-fourths as large as first molar, which is the largest upper tooth. Second molar distinctly smaller than first and about twice as large as third. The crowns of the premolars and the first and second molars are each crossed by two ridges of enamel, isolating three narrow depressions, the posterior of which is so narrow as to be practically invisible to the unaided eye (fig. 19, *a*). Third molar with one ridge and two depressions in the type, two ridges and three depressions in an older specimen with very much worn teeth.

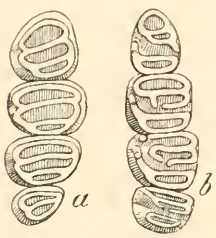

Fig. 19.—Teeth of *Idiurus macrotis*; *a* upper, *b* lower. ($\times 7\frac{1}{2}$.)

First and second lower molars (fig. 19, *b*.) essentially equal in size, but second slightly the larger. Third molar considerably smaller than second

* "Gaumenbein fast doppelt so breit wie die Zahnreihe . . ."

† The fenestration in *I. zenkeri* may be due to injury during preparation of the specimen.

and about equal to premolar. Enamel pattern essentially as in the maxillary teeth, but less regular.

General remarks.—The type of *Idiurus zenkeri* is an old adult female ("ein sehr altes Weibchen"), while the two specimens of *I. macrotis* are males, one young adult, the other old. Yet the differences between the two forms are too great to be ascribed to sexual variation. That two or more species of a genus so peculiar as *Idiurus* should occur in the Cameroon district is not at all improbable. Neither can it be wondered at that animals so perfectly protected by color and form (the general appearance is well shown in Mr. Matschie's figure) should successfully escape notice, especially if, as is probably the case, they are strictly nocturnal in habits.

Measurements of Idiurus macrotis and I. zenkeri.

	I. zenkeri.	*I. macrotis.*	
Number	.....	83625	83626
Sex	♀	♂	♂
Total length	.....	241	228
Head and body	65	.....	.....
Tail vertebræ	100	133	123
Pencil	30	36	38
Hind foot	15	21	22
Ear: from meatus	12.5*	18	17
from crown	.....	16	15.5
width	.....	10.6	10
Skull: Basal length	17	.....	.....
Greatest length	22	26	27
Zygomatic breadth	13	15	16
Length of frontals	9	9.6	9.8
Least width of frontals	6	7	7
Length of nasals	5	7	7
Greatest breadth of nasals	3.25	3.25	3.3
Tip of nasals to gnathion	8.75	10	9.8
Incisor to premolar	6	6	6.8
Upper tooth row	2.8	3.8	4
Greatest distance between inner border of molars (m. 3)	.....	2.2	2
Least distance between inner border of molars (m. 1)	2†	1.2	1.2
Width of first true molar	.....	1.4	1.6
Mandible: Greatest length	11.5	15	16
Greatest depth	8	10	10.6
Lower tooth row	2.5	4	4

* By 'Ohr' Mr. Matschie may mean ear from crown.

† "Entfernung der inneren Ränder der beiden Reihen."

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

MARINE BIOLOGICAL LABORATORY

THE EASTERN RACES OF THE AMERICAN VARYING HARE, WITH DESCRIPTION OF A NEW SUBSPECIES FROM NOVA SCOTIA.

BY OUTRAM BANGS.

The American Varying Hare (*Lepus americanus*), with its various forms, occupies the whole of the northern part of North America north to the limit of trees. It is distinctively an inhabitant of the cool, damp, coniferous forest, differing in this respect from its congeners that prefer more open and grassy country.

Its food consists principally of the young, tender shoots of conifers—spruce, fir, etc.—but it also eats the twigs and buds of the alder and other shrubs. In summer, grasses, reeds, and herbaceous plants form part of its diet; but even at this season the young branches and leaves of conifers are generally found in its stomach. Its flesh usually has a strong and, to me, unpleasant spruce taste.

In eastern North America the Varying Hare may be divided into three geographical races:

1. *Lepus americanus americanus* Erxl., occupying Labrador.
2. *Lepus americanus virginianus* (Harlan), occupying the cool, damp forests and swamps of the Hudsonian, Canadian, and Transition zones. In the Alleghanies it extends south to Virginia and West Virginia.
3. *Lepus americanus struthopus* Bangs, occupying the peninsula of Nova Scotia.

In all three races a white pelage, which is more complete in

northern than southern localities, is assumed at the approach of winter.*

The three eastern races are as follows:

Lepus americanus americanus (Erxleben).

Lepus americanus Erxl. Syst. Anim., p. 330, 1777.

Type locality.—Hudson Strait, south side.

Geographic distribution.—Labrador and perhaps the higher Hudsonian regions of central North America.

Subspecific characters.—Hind foot large; general color of upper parts (in summer pelage) shades of light yellowish brown and drab; a conspicuous white border to ear, all around, even in the young; skull short and broad, not deeply constricted behind postorbital processes; incisor teeth very slender and slightly projected outward.

Color.—Adult in summer pelage: upper parts varying individually from hair-brown and drab to tawny clay color, many black tipped hairs

* This peculiarity of not turning completely white in winter has been given as one of the principal characteristics of the southern race (*L. americanus virginianus*), but it does not seem a difference of any great importance and surely not one on which a subspecies could be based. The problem of how the winter coat is acquired has given rise to a good deal of discussion among naturalists, some taking the view that it is due to a change in the color of the hair itself, and others that it is brought about by a moult. Dr. J. A. Allen (Bull. Am. Mus. of Nat Hist., vol. VI, p. 107, 1894), who studied the question carefully and with considerable material, is firmly convinced that the latter view is the correct one. It seems to me that the bottom of the question has not yet been reached.

In spring the case is clear enough, and the change from the white winter to the brown summer dress is wholly due to a moult. The long white hairs fall out, leaving the animal clothed in a coat consisting mainly of the under fur, through which can be seen patches of the incoming brown hairs of summer. The case is not so clear in autumn. In late summer we find the adult hares in such short and worn pelage that in places the skin often shows through. When the cool weather of autumn comes and the hares stop breeding, a moult begins, in which the change is not to a white winter dress, but to a long full coat of brown, like that of summer. Before this moult is complete, however, the animal gradually begins to turn white. During this process many of the new hairs are white from the time they first appear, but what happens to the new brown hairs that have just been grown is a question. Does it seem that in the economy of nature these should again be shed before they have served their purpose? If hair and feathers can change color, as many suppose, does it not seem reasonable to assume that the American Varying Hare comes by his winter coat in two ways? Some hairs are white from the time they first appear, but others, which at first are brown, grow to their full length and then change to white.

intermixed along back and on top of head; flanks, arms, pectoral band, and often lower sides, rather brighter, more tawny ochraceous; belly and chin to pectoral band dull white; ears dusky toward tips, bordered by a very conspicuous white band; legs and feet (sometimes hands also) dull white irregularly blotched by patches of tawny and ochraceous-buff; soles dusky, often stained, sometimes having an olivaceous cast. Young not essentially different, except that the legs and feet are not white, but pale tawny or ochraceous-buff. Winter pelage: pure white.

Cranial characters.—Skull short and broad, not deeply constricted behind postorbital processes; nasals wide and flattened on upper surface; incisor teeth very slender and slightly projected outward.

The skull is difficult to tell from that of *L. virginianus*, except by its much more slender incisors, which in all I have examined have never failed to distinguish it.

Measurements.—Averages of nine fully adult specimens of both sexes from Hamilton Inlet (near Rigoulette), Labrador: Total length, 471.33; tail vertebræ, 34.22; hind foot, 146.77. (For individual measurements see table.)

Remarks.—*Lepus americanus americanus* has a more northern and I think a more restricted distribution than has usually been attributed to it. I have seen no specimens except from Labrador. However, it may occur around the shores of James Bay and thence westward into the interior. One specimen collected by Gerrit S. Miller, Jr., at North Bay, Ontario, is apparently an intergrade, though much nearer *virginianus*, since it has the broad incisor teeth and more constricted interorbital region characteristic of that subspecies. In color it is nearer true *americanus*, but the white border of the ears is not as pronounced as in that form. Specimens from Mt. Forest, Ontario, and Lake Edward, Quebec, are nearly alike and differ widely from true *americanus*. In March, 1893, Mr. Will C. Colt collected a series of varying hares for me at Osler, Saskatchewan. All of these specimens are in winter pelage. They are not true *americanus*, and perhaps represent still another race. They are small, with small skulls, having rather narrow nasals and very broad and strong incisor teeth. It thus appears that if true *americanus* finds its way far into the interior of the country, it must be restricted to the high Hudsonian regions near the limit of trees.

L. americanus americanus is very abundant throughout the wooded region of the Labrador peninsula.

I have a series of fourteen specimens collected near Rigoulette, Hamilton Inlet, in the summer of 1895, by C. H. Goldthwaite.

Lepus americanus virginianus (Harlan).

Lepus virginianus Harlan. Fauna Americana, p. 196, 1825.

Type locality.—Blue Mountains, Pennsylvania.

Geographic distribution.—Lower Hudsonian, whole of Canadian and much of Transition zones of eastern North America, except Nova Scotia. From Ontario, Quebec, and New Brunswick it ranges south on the coast

to southern Massachusetts and northern Connecticut and formerly, perhaps, even to New Jersey; in the Alleghany Mountains to Virginia and West Virginia.

Subspecific characters. - Size of or slightly larger than *L. americanus americanus;* hind foot shorter; skull longer and more deeply constricted behind postorbital processes; incisor teeth much broader and more curved backward; general color of upper parts (in summer pelage) shades of rich reddish brown, russet, and dull ferruginous; white border of ear narrow and inconspicuous, often wanting.

Color.—Adult in summer pelage: upper parts varying individually from russet to dull, deep ferruginous, generally with a copious intermixture of black tipped hairs along back and on top of head; belly and chin white; pectoral band colored like back, but without black tipped hairs; ears without white border or with a narrow and inconspicuous one; legs, feet, hands, and arms seldom white, though sometimes irregularly blotched with white or buff. Young, similar to adults. Winter pelage: white, the under fur and some of the longer hairs often retaining part of their color throughout the winter, especially in more southern localities.

Cranial characters.—Skull longer and narrower than that of *L. americanus americanus;* more deeply constricted behind postorbital processes; nasals narrower, longer, and less flattened; incisor teeth broad and strong and more curved backward. The character of the incisor teeth will always serve to distinguish skulls of *L. americanus americanus* from those of *L. americanus virginianus.*

Measurements.—Average of nine fully adult specimens, males and females, from Maine, New Hampshire, and Massachusetts: total length, 475; tail vertebræ, 41.22; hind foot, 140.55 (for individual measurements see table).

General remarks.—*Lepus americanus virginianus* has an extensive distribution, being the form found over the greater part of the range of the species in eastern North America. In the southeastern part of its range, in Massachusetts and Connecticut where it was formerly very common, it is year by year becoming rarer and more local. In this region it is only found in cool, dark woods, extensive tracts of white cedar and white pine being its favorite home. Gradually but steadily, as spots suited to its needs become fewer and smaller, it is being replaced by its more progressive and adaptive cousin, the cotton-tail. Farther north, where the continuous forest of spruce and fir affords it an immense range, it still occurs in great abundance.

Unfortunately, I have seen no specimens from Pennsylvania, nor from the southern Alleghany Mountains. Mr. Thaddeus Surber writes me that it still occurs in the heavy hemlock and spruce forests of some of the higher mountains near White Sulphur Springs, West Virginia.

Lepus americanus virginianus varies but little in the large area it occupies. Specimens from New Brunswick are exactly like those from Massachusetts, and some of the most extreme and richly colored examples I have seen came from Mt. Forest, Ontario, and Lake Edward, Quebec. This is easily accounted for by the animal's peculiar requirements and

mode of life, which are the same throughout its range. In Transition country it only occurs in deep, dark, moist woods, where the conditions are the same as those offered by a much more northern climate. That it has but a weak hold upon a place in the fauna of the Transition zone is shown by the rapidity with which it disappears when the conditions that enabled it to exist there are slightly changed.

I have specimens from Quebec, Ontario, New Brunswick, Maine, New Hampshire, and Massachusetts.

Lepus americanus struthopus subsp. nov.

Type from Digby, Nova Scotia. No. 2025, ♀ ad., coll. of E. A. and O. Bangs. Collected August 4, 1894, by Outram Bangs.

Geographic distribution.—Province of Nova Scotia.

Subspecific characters.—Size of *L. americanus virginianus;* hind foot much smaller; color (in summer pelage) darker and duller, rarely showing the reddish brown shades seen in *virginianus;* otherwise similar to *virginianus.*

Color.—Adult in summer pelage: Upper parts varying individually from raw umber to bistre, sometimes shaded about head, neck, and on flanks with dull ferruginous; black tipped hairs not numerous, often arranging themselves into a narrow dorsal stripe; belly and chin to pectoral band dull white; ears dark brown above, becoming dusky or black at tips, narrowly bordered by a yellowish brown band; hands and feet irregularly marked with dusky and sometimes with whitish blotches. Young similar to adults. Winter pelage, white.

Cranial characters.—The skull of *L. americanus struthopus* is in all essential characters like that of *L. americanus virginianus.* The audital bullæ are constantly a little smaller.

Measurements.—Average of nine fully adult specimens, males and females, from Nova Scotia: Total length, 474.77; tail vertebræ, 49.83; hind foot, 127.38. (For individual measurements see table.)

Remarks.—*Lepus americanus struthopus* is a peninsular form confined to the Province of Nova Scotia. It probably intergrades with *L. americanus virginianus,* though I have seen no specimens from that part of Nova Scotia adjoining New Brunswick. The principal character that distinguishes the Nova Scotia hare is its remarkably small hind foot. The color of the summer pelage is usually much darker and duller than in *L. americanus virginianus.* In my series of twelve in full summer pelage one specimen only is about the color of average specimens of *virginianus,* all the others being much darker. The dusky markings on feet, hands, nape, and top of head so common in *struthopus* are rarely, if ever, present in *virginianus.*

Lepus americanus struthopus is exceedingly abundant throughout the Province of Nova Scotia, except on the hard-wood ridges.

Within a few years this form has been introduced into Newfoundland, and finding there a region exactly suited to its needs, with no indigenous competitor, it has increased with great rapidity, so that now it is quite generally distributed throughout the southern part of the island. I am

told that these hares were caught near Halifax. It will be interesting to watch their career in Newfoundland and see how long it will take the modifying influences of the new island home to work a change. If I might hazard a guess, this will be in the direction of still darker coloration.

Measurements of the eastern races of Lepus americanus (adult specimens).

Locality.	No.	Sex.	Total length.	Tail vertebræ.	Hind foot.
Lepus americanus americanus Erxl.					
Labrador, Hamilton Inlet	4152	♀	476	36	155
" " "	4153	♂	475	40	150
" " "	4160	♀	483	33	142
" " "	4164	♂	486	37	152
" " "	4154	♂	475	35	146
" " "	4156	♀	466	37	143
" " "	4161	♀	463	33	150
" " "	4155	♂	463	25	142
" " "	4163	♂	455	32	141
Lepus americanus virginianus (Harlan).					
Massachusetts, Middleboro	1730	♀	452	46	137
New Hampshire, Webster	5815	♂	465	44	141
" " "	5814	♂	505	44	146
Maine, Bucksport	4245	♀	462	46	131
Maine, Upton	4195	♂	475	35	140
Maine, Greenville	4963	♂	490	50	149
" "	4967	♂	463	53	139
" "	4966	♂	490	50	142
" "	7273	♀	473	43	140
Ontario, Mt. Forest	1785	♂	485	47	147
" " "	1786	♂	457	46	133
Quebec, Lake Edward	3821	♂	481	44	153
" " "	3822	♀	482	49	143
Lepus americanus struthopus Bangs.					
Nova Scotia, James River	2028	♀	483	32	131
Nova Scotia, Digby	120	♀	511	50	137.5
" " "	121	♂	469	54	125.5
" " "	123	♂	461	48	129.5
" " "	124	♂	464	51	118
" " "	119	♂	479	54.5	125
" " "	122	♂	467	55	129
" " " type	2025	♀	474	54	125
" " "	2026	♂	465	50	126

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTION OF A NEW WHITE-FOOTED MOUSE FROM THE MOUNT BAKER RANGE, BRITISH COLUMBIA.

BY OUTRAM BANGS.

Several mice from the northwest belonging to the very distinct *austerus-canadensis* group of the genus *Peromyscus* have already been brought to notice. The subject of the present description is another that seems entitled to recognition. The group to which it belongs is a boreal one, and is distinguished from the *leucopus* group externally by a long hairy, sharply bicolored tail (as long or longer than the head and body), with decided pencil, and cranially by a broad flattened braincase and elongate slender rostrum. It probably has a transcontinental range and its members are all forest-dwellers.

The recognized forms are as follows:

Peromyscus austerus (Baird).
Coast lowlands and valleys of Washington and British Columbia; Transition Zone.

P. keeni (Rhoads).
Queen Charlotte Islands, B. C.

P. macrorhinus (Rhoads).
Skeena River, B. C.

P. sitkensis Merriam.
Sitka, Alaska.

P. oreas Bangs.
Cascade Mountains of Washington and southern British Columbia; Boreal Zone.

P. canadensis canadensis (Miller).
Cool, dark forests of Canadian and Transition Zones in eastern North America.

P. canadensis abietorum Bangs.

Hudsonian and upper Canadian Zones of eastern North America.

P. canadensis umbrinus Miller.

North shore of Lake Superior.

P. canadensis nubiterræ Rhoads.

Higher Alleghany Mountains of North Carolina, Tennessee, West Virginia, and northward to Pennsylvania.

Peromyscus oreas* sp. nov.

Type from Mt. Baker Range, 49th parallel, British Columbia. Altitude, 6500 ft. No. 3696, ♀ ad., coll. of E. A. and O. Bangs. Collected August 29, 1896, by Allan C. Brooks.

General characters.—Size medium (smaller than *P. macrorhinus*); color of upper parts rich reddish-brown; skull smaller and less exaggerated in character than that of *P. macrorhinus*.

Color.—Upper parts in adult, rich brown (varying from Prouts' brown to russets), slightly darkened along middle back by the admixture of black-tipped hairs, forming an indistinct darker dorsal stripe; orbital ring black, narrow, and inconspicuous; under parts dull white, the plumbeous under fur showing through; feet and hands white; ears large, dusky, in fresh pelage with narrow white edges; tail long, sharply bicolor, black above, white below, a long pencil at end. Younger individuals are somewhat darker and less reddish brown above.

Cranial characters.—The skull is smaller than that of *P. macrorhinus*, but has the flat, broad braincase and long slender rostrum peculiar to the group. These characters are rather less pronounced in *P. oreas* than in *P. macrorhinus*.

Measurements.—Type, ♀ ad.; total length, 200; tail vertebræ, 101; hind foot, 24. Topotype, No. 3694, ♂ ad.: total length, 207; tail vertebræ, 114; hind foot, 24.

Skull of type, ♀ ad.: basilar length of Hensel, 20.6; zygomatic breadth, 13.4; incisors to postpalatal notch, 10.8; length of nasals, 11.8.

Remarks.—*P. oreas* appears to be specifically distinct from *P. austerus*, the smaller and very much darker form of the adjacent lowlands.

Mr. Brooks took *P. austerus* at Sumas, B. C.; while in the high mountains of the Mount Baker range he got *P. oreas*. I have also a series of fifty specimens of *P. oreas* taken in the mountains above Hope, B. C., in 1894, by Will C. Colt. These are exactly like the Mount Baker examples, and it is therefore probable that *P. oreas* occupies all the higher mountains of northern Washington and southern British Columbia.

It is probable that *P. oreas* intergrades with *P. macrorhinus*. It is distinguished from that form by smaller size, more reddish brown color, and smaller skull, with the peculiar characters less exaggerated. With the enormous *P. sitkensis*, it needs no comparison, nor does it with *P. keeni*, the type of which I have examined and found to be quite close to *P. austerus*.

* Oreas = a mountain nymph, Oread.

Vol. XII, pp. 85-90 April 30, 1898

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF ELEVEN NEW SPECIES AND SUBSPECIES OF VOLES.

BY VERNON BAILEY.

The following brief descriptions of new species and subspecies of *Microtus* are here published in advance of a more extended paper on the group, in which all the known American species are discussed. All of the new forms here described are in the Biological Survey Collection and the private collection of Dr. C. Hart Merriam, both in the U. S. National Museum.

Microtus dutcheri* sp. nov.

Type from Big Cottonwood Meadows, near Mt. Whitney, Calif. (10,000 ft. alt.). No $\frac{29769}{111848}$, ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected July 10, 1891, by B. H. Dutcher. Orig. No. 69.

General characters.—Size rather small; tail short; ears small, nearly concealed by fur; colors dark above and below; lips (and usually nose) white; hip glands present in adult males.

Color.—Summer pelage: Above, dark bister with brown tips to the long hairs; below, dull cinnamon or buffy-brown; feet whitish or plumbeous-gray; tail bicolor, whitish below, brown or blackish above; lips and usually tip of nose white. *Winter pelage* unknown. *Young*, dull brown above and scarcely lighter below; feet and tail blackish; lips and nose usually white.

Cranial characters.—Skull similar to that of *M. montanus*, but differing in many details; rostrum slightly longer; bullæ smaller and less globular; lateral pits of palate shallower; dentition the same.

Measurements.—Type, ♂ ad.: Total length 167; tail vertebræ 35; hind foot 20. Average of 10 adult specimens from type locality: Total length

* Named in honor of Dr. B. H. Dutcher, who collected the type series.

163; tail vertebræ 37; hind foot 20.6. *Skull of type:* Basal length 27.4; nasals 8; zygomatic breadth 16.7; mastoid breadth 12.2; alveolar length of upper molar series 6.5.

Microtus insularis sp. nov.

Type from Great Gull Island, New York, No. $\frac{4952}{37065}$, ♂ im., Merriam Coll. Collected Aug. 6, 1888, by B. H. Dutcher.

General characters.—Size of *pennsylvanicus;* colors darker; skull shorter and wider with spreading zygoma and deep prezygomatic notches.

Color.—*August pelage:* Above, dark yellowish bister heavily mixed with black hairs, darkest on nose and face; belly dusky, washed with cinnamon; feet blackish; tail black above, color of belly below.

Cranial characters.—The skull differs from that of *pennsylvanicus* in shorter, wider brain case; wider and more abruptly spreading zygomatic arches; broader zygomatic shield; smaller audital bullæ; palate short with a median point or spur and deep lateral pits. Posterior upper molar with second inner and outer angles approximately opposite and confluent; dentition otherwise similar to that of *pennsylvanicus.*

Measurements.—Type, measured from dry skin: Tail 29; hind foot 20. Skull, No. 43969, from Little Gull Island: Basal length 26; zygomatic breadth, 16.2; mastoid breadth 12.3; alveolar length of upper molar series 6.8.

Microtus angusticeps sp. nov.

Type from Crescent City, California. No. $\frac{17087}{24008}$, ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected June 16, 1889, by T. S. Palmer. Orig. No. 151.

General characters.—Smaller and darker than typical *mordax,* with very narrow, slender skull and small audital bullæ.

Color.—*Summer pelage:* Upper parts dark bister, lined with black hairs, darkest on face and nose; sides paler; belly washed with creamy white; feet plumbeous-gray; tail distinctly bicolor, blackish above, soiled white below.

Cranial characters.—Skull small and very narrow, distinctly ridged in adults; nasals projecting in front of incisors; incisive foramina short; audital bullæ very small and constricted; coronoid notch of mandible narrow; incisors slender; molars small with narrow, sharp angles; enamel pattern as in *M. mordax.*

Measurements.—Type, ♂ ad.: Total length 170; tail vertebræ 56; hind foot 22. *Skull of type:* Basal length 23.4; nasals 7.6; zygomatic breadth 13.5; mastoid breadth 10.8; alveolar length of upper molar series 6.

Microtus nevadensis sp. nov.

Type from Ash Meadows, Nye Co., Nevada. No. $\frac{26877}{34291}$, ♀ ad., U. S. Nat. Mus., Biological Survey Coll. Collected March 2, 1891, by E. W. Nelson. Orig. No. 577.

General characters.—Size large; ears small; tail rather short; fur coarse and lax; colors dark; hip glands conspicuous in adult males. Skull massive and angular; incisive foramina narrow and closing to a point posteriorly.

Color.—*March specimens:* Above dark sepia or bister, much obscured by blackish hairs: sides lighter; belly smoky gray; feet dark gray; tail indistinctly bicolor, blackish above, gray or brownish below; lips usually white; tip of nose in adult usually whitish. Young with a blackish dorsal stripe and dusky feet and tail.

Cranial characters.—Skull heavy, angular, and much ridged; frontals high; rostrum bent downward; incisive foramina short, rather narrow and constricted to a point posteriorly; dentition heavy; upper incisors curved abruptly downward; first upper molar with 5 closed triangles; second with 4 triangles in 8 out of 16 specimens; in the other 8, with a slight inner lobe or loop at base of posterior triangle; third with anterior crescent, three closed triangles and a posterior loop with two inner lobes or horns.

Measurements.—*Type specimen:* Total length 210; tail vertebræ 55; hind foot 25.5. Average of 8 specimens from type locality: Total length 176; tail vertebræ 47; hind foot 23. *Skull of type:* Basal length 32; nasals 10.2; zygomatic breadth 19.3; mastoid breadth 14.3; alveolar length of upper molar series 8.

Microtus nevadensis rivularis subsp. nov.

Type from St. George, Utah, No. $\frac{51173}{5567}$, ♂ ad., Merriam Coll. Collected Jan. 6, 1889, by Vernon Bailey. Orig. No. 493.

General characters.—Smaller and lighter colored than its nearest relative, *M. nevadensis;* skull less rigid and angular; bullæ larger; incisive foramina longer and narrower; ears small, nearly concealed by fur.

Color.—*Winter pelage:* Upper parts dull bister, darkened with blackish tipped hairs (similar to *californicus*); sides scarcely paler; belly washed with whitish; feet dull grayish; tail bicolor, grayish below, blackish above. Young darker than adults, but not black backed.

Cranial characters.—Skull smaller and slenderer than skulls of *nevadensis* of equal age; audital bullæ much larger and fuller; anterior end of basioccipital narrower; incisive foramina narrower and actually as well as relatively longer; angular process of lower jaw longer and slenderer; incisors much slenderer; molar pattern essentially the same.

Measurements.—Type: Total length 179; tail vertebræ 48; hind foot 23. *Skull of type:* Basal length 28.2; nasals 8.3; zygomatic breadth 17; mastoid breadth 13.3; alveolar length of upper molar series 7.3.

Microtus nanus canescens subsp. nov.

Type from Conconully, Washington. No. 90577, ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected Sept. 12, 1897, by J. Alden Loring. Orig. No. 4654.

General characters.—Like *nanus* but paler, clearer gray; skull with larger bullæ and greater mastoid breadth; zygomatic arches less widely spreading; upper incisors bent more abruptly downward. Hip glands conspicuous in adult males.

Color.—Summer pelage: Above, clear dark grayish, formed by pale buffy and black tipped hairs; sides shading to lighter gray and belly to white; feet dark gray; tail bicolor, grayish below; blackish above.

Cranial characters.—Skull slightly narrower and more elongate than in *nanus;* interparietal averaging longer; bullæ decidedly larger and fuller; mastoid breadth relatively greater; incisors scarcely reaching beyond nasals; molar pattern as in *nanus.*

Measurements.—Type: Total length 149; tail vertebræ 42; hind foot 20. *Skull of type:* Occipital condyle to anterior base of molars 17.4; posterior tip of nasals to foramen magnum 19.2; zygomatic breadth 15; mastoid breadth 12.3; alveolar length of upper molar series 6.3.

Microtus montanus arizonensis subsp. nov.

Type from Springerville, Arizona. No. $\frac{24778}{32179}$, ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected Nov. 7, 1890, by E. W. Nelson. Orig. No. 153.

General characters.—Similar to *M. montanus,* but brighter and more ferruginous; lateral pits of palate shallower.

Color.—October and November pelage: Above, yellowish or rusty brown; belly washed with white; feet dark grayish; tail bicolor, grayish below; blackish above; lips whitish. Slightly immature specimens are a little duller in color than adults.

Cranial characters.—Skull very similar to that of *montanus,* but easily distinguished by the flatter palate with shallower lateral pits, and by thicker pterygoids; condyloid process of mandible slightly shorter; dentition not different.

Measurements.—Type: Total length 184; tail vertebræ 55; hind foot 20. Average of 7 specimens from type locality: Total length 158; tail vertebræ 41; hind foot 20.6. *Skull of type:* Basal length 27.3; nasals 8; zygomatic breadth 16; mastoid breadth 12.2; alveolar length of upper molar series 6.5.

Microtus pennsylvanicus labradorius subsp. nov.

Type from Ft. Chimo, Ungava, Labrador. No. $\frac{5481}{6566}$, ♀ ad., Merriam Coll. Collected Nov. 15, 1882, by L. M. Turner.

General characters.—Size and proportions approximately as in *Microtus drummondi.* Skull flatter with much smaller audital bullæ and more protruding upper incisors.

Color.—(Much changed by alcohol): Above, dark brownish; belly whitish; tail bicolor; feet pale.

Cranial characters.—Skull flattened, not much ridged or angled; postorbital ridge prominent; nasals short, cuneate, and scarcely reaching

base of incisors; audital bullæ small; incisive foramina short; first upper molar usually with a posterior lobe on inner side; molar pattern otherwise as in *pennsylvanicus*. The skull is readily distinguishable from either *drummondi* or *fontigenus* by the protruding incisors and small audital bullæ.

Measurements.—Type, ♀ ad., measured from alcohol: Total length 139; tail vertebræ 39; hind foot 20. Average of 7 specimens from type locality, measured from alcohol: Total length 137; tail vertebræ 37; hind foot 19. *Skull of type:* Basal length 24.3; nasals 6.7; zygomatic breadth 14.4; mastoid breadth 11; alveolar length of upper molar series 6.2.

Microtus californicus vallicola subsp. nov.

Type from Lone Pine, Inyo Co., California. No. $\frac{25393}{32805}$, ♀ ad., U. S. Nat. Mus., Biological Survey Coll. Collected Dec. 23, 1890, by E. W. Nelson. Orig. No. 149.

General characters.—Similar to *M. californicus* but averaging slightly larger and darker; proportions the same.

Color.—*Summer pelage:* Upper parts dull sepia, darkened by black tipped hairs—darker and with less yellowish suffusion than in *californicus;* below dull grayish or smoky plumbeous; feet dusky; tail bicolor, grayish below; blackish above. *Winter pelage:* darker throughout, with black hairs of back longer and more conspicuous.

Cranial characters.—Skull like that of *californicus,* but audital bullæ usually smaller; occiput more abruptly truncate; nasals reaching nearer to tips of premaxillæ; middle upper molar with lobe at base of 4th triangle often developed into a loop.

Measurements.—Type, ♀ ad.: Total length 200; tail vertebræ 57; hind foot 23. Average of 7 specimens from type locality: Total length 188; tail vertebræ 56; hind foot 23. *Skull of type:* Basal length, 29.4; nasals 9.5; zygomatic breadth 17.6; mastoid breadth 13.4; alveolar length of upper molar series 7.4.

Microtus pinetorum nemoralis subsp. nov.

Type from Stilwell (Boston Mts.), Indian Territory, No. 87246, ♀ ad., U. S. Nat. Museum, Biological Survey Coll. Collected April 7, 1897, by J. Alden Loring. Orig. No. 3905.

General characters.—Size, largest of the subgenus *Pitymys* in the United States; ears large; fur long and coarse; colors duller than in *pinetorum,* but not so dark as in *scalopsoides.*

Color.—Upper parts dull chestnut, slightly lined with blackish tipped hairs on back and rump, becoming paler on sides; belly washed with cinnamon rufous over the plumbeous underfur; tail indistinctly bicolor, agreeing with dorsal and ventral colors of body; feet thinly clothed with pale buffy or sometimes dusky hairs.

Cranial characters.—Skull large and relatively elongated; supraoccipital sloping; interparietal narrow; mastoids and audital bullæ large and pro-

jecting farther back than in *pinetorum:* palate often with a posterior point projecting into the U-shaped interpterygoid fossa; molar series long; third upper molar with three tightly closed triangles and an irregular posterior loop; first lower molar with opposite reëntrant angles meeting behind the anterior loop.

Measurements.—Type specimen: Total length 130; tail vertebræ 24; hind foot 18. Average of five females and five males from type locality: Total length 135; tail vertebræ 25; hind foot 18.1. *Skull of type:* Basal length 25.3; nasals 7.7; zygomatic breadth 16.5; mastoid breadth 13.4; alveolar length of upper molar series 7.

Microtus pinetorum auricularis subsp. nov.

Type from Washington, Miss., No. $\frac{34062}{48139}$, ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected May 26, 1892, by Vernon Bailey. Orig. No. 3649.

General characters.—Size small, about equalling *pinetorum;* ears very large for a *Pitymys* and conspicuous above fur; colors dark and rich; fur short and dense like that of *pinetorum.*

Color.—Upper parts dark rich chestnut darkened by dusky tipped hairs; under parts washed with paler chestnut over dark under fur; projecting tip of ear with scattered dusky hairs; tail not bicolor, scarcely darker above, like the back or slightly darker; feet dull brownish.

Cranial characters.—Skull like that of *pinetorum* in general form and characters, but interpterygoid fossa normally U-shaped instead of V-shaped; third upper molar with three closed triangles; first lower molar with first pair of reëntrant angles meeting behind anterior loop.

Measurement.—Type: Total length 120; tail vertebræ 22; hind foot 16. *Skull of type:* Basal length 22.3; nasals 7; zygomatic breadth 15.2; mastoid breadth 12.3; alveolar length of molar series 6.

Vol. XII, pp. 91-92 April 30, 1898

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW RACCOON FROM NASSAU ISLAND, BAHAMAS.

BY OUTRAM BANGS.

The announcement lately made by Mr. Oldfield Thomas* of the existence of two distinct species of indigenous Muridæ in the West Indies, *Oryzomys antillarum*, of Jamaica, and *O. victus*, of St. Vincent, has somewhat changed our ideas of the mammalian fauna of these islands. Mr. C. J. Maynard has, moreover, known for many years that a raccoon was abundant on Nassau Island.

Before Mr. Maynard started on his last trip to the Bahamas I begged him to get specimens of this raccoon. But his time was so occupied in collecting other objects of natural history, in which he was more interested, that it is doubtful if he would have secured one at all if just before he started for home some negroes had not brought him a female that they had caught alive. Mr. Maynard brought her home alive, and on the voyage she gave birth to one young, also a female. The two are now alive and well at Mr. Maynard's place in Newton, Mass., where I went last summer to see them. I was at once struck by the small size of these raccoons, and got Mr. Maynard to write to his friend, Mr. Herbert L. Claridge, at Nassau, to get me a specimen. In due course Mr. Claridge sent me one, a young male, unfortunately with the back part of the skull smashed. The small size of this specimen, together with the peculiarities of the unbroken part of the skull, are sufficient to distinguish the animal as a distinct island form.

There is no tradition among the inhabitants of Nassau that

*Ann. and Mag. Nat. Hist., ser. 7, vol. I, Feb., 1898, p. 176.

the raccoon was ever introduced upon the island, and I am unable to say from what continental stock it was derived.

The raccoon is abundant upon Nassau, but Mr. Maynard believes that it does not exist upon any of the other islands of the Bahama group.

The Nassau raccoon may well bear the name of its discoverer, who has done, and is doing, so much work on the Bahamas.

Procyon maynardi sp. nov.

Type from Nassau Island, Bahamas. No. 7750, ♂ young, coll. of E. A. and O. Bangs. Collected in August, 1897, by Herbert L. Claridge.

Specific characters.—Size small; hind foot small; colors and markings as usual; shoulder patch not so intensely colored and more overlaid by black hairs than in the Florida form (*P. lotor elucus*). Skull small; palatine extension very short and narrow; upper carnassial and molar teeth small and less square than in *P. lotor*, especially on the inner sides, which are much less truncate and more pointed.

Cranial characters.—The skull of the type and only specimen, a young male with the second teeth fully developed but unworn, consists of the forward parts of the skull only; the back from behind the nasals and behind the palatine extension is missing. Compared with skulls of *P. lotor* of the same age, it is smaller; palate narrower; palatine extension much shorter and narrower; malar slender and weak; infraorbital foramen large. The best character is the short narrow palatine extension. Probably a more perfect skull would show other characters.

Dental characters.—The teeth of *P. maynardi* are small and the upper carnassial and molar teeth quite differently shaped from those of *P. lotor*. They are shorter and broader—*i. e.*, much less square. The inside edges of these teeth in *P. lotor* are truncate, in *P. maynardi* they slope off from front and back into a rounding point, the last molar showing this peculiarity most strongly.

Measurements.—The type, ♂ young (from dried skin, apparently a little shrunken): Total length, 623; tail vertebræ, 210; hind foot, 96. Skull: length of nasals, 28.6; length of palate, 58.2; width of palate at middle of carnassial tooth, 17.2; length of palatine extension from a line across alveoli of last upper molars to end of pterygoid process, 23.8; to end of palate, 12.6; least width of palatine extension, 13.6; length of single half of mandible, 72.2.

VOL. XII, PP. 93-94 APRIL 30, 1898

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTION OF A NEW FOX FROM SANTA MARTA, COLOMBIA.

BY OUTRAM BANGS.

Among a small lot of mammals just received from Wilmot W. Brown, Jr., who is making collections in the Santa Marta Mountains, Colombia, for the Bangs collection, are two examples of an interesting new fox, which may be known as—

Urocyon aquilus* sp. nov.

Type from Santa Marta Mountains, Colombia, altitude between 2000 and 3000 feet, ♂ old adult, No. 8001, coll. of E. A. and O. Bangs. Collected Feb. 10, 1898, by W. W. Brown, Jr. Orig. No. 58.

Specific characters.—Similar in general external appearance to *U. cinereoargenteus*; colors dark, black the predominating color of upper parts, dull ochraceous buff of under parts; size small; tail short; skull large and massive, differing much from that of the North American gray foxes (true *Urocyon*).

Color and pelage.—Upper parts: Pelage short, hispid, the hairs banded, mostly with four distinct rings—wood-brown at base, then black, then wood-brown and black tipped, the black tips deeper along back from behind ears to base of tail, shorter and less conspicuous on sides and top of head, the black predominating on dorsal region and mixed black and dull brownish on sides; under fur mouse-gray at base, yellowish at tips; sides of neck behind ears tawny, under parts dull ochraceous buff with a decided vinaceous tint on lower belly, at base of tail and between arms; chin grizzled black; toes and fingers dull brownish black; ears brownish black, dull tawny around edges, nearly naked inside; tail very short, narrow, not bushy, black above and at tip, dull clay color below.

*Aquilus = dark-colored.

Cranial characters.—The skull of *U. aquilus* is large (very large for the size of the animal) and massive; the region enclosed between the temporal ridges is narrow and the ridges themselves less strongly marked than in *U. cinereoargenteus;* no depression between postorbital process and frontal, the frontals being evenly rounded; postorbital processes small; zygomatic arch heavy and very low and straight, the malar very low down, leaving little space between it and molar teeth; palate broad; audital bullæ short, deep, and round (very differently shaped from those of *U. cinereoargenteus*); mandible like that of *U. cinereoargenteus*, with the peculiar narrow, straight, tapering rami, except that the notch at posterior end of lower side of ramus is not so strongly marked.

The dentition, though heavy throughout, is normal.

Measurements.

No.	Sex.	Total length.	Tail vert.	Hind foot.	Ear from notch.
8001, type	♂ old ad.	900	300	120	60
8002, topotype	♀ yg. ad.	860	290	125	65

Skull (type, ♂ old adult): Basal length, 122; zygomatic breadth, 74.6; mastoid breadth, 48; breadth across postorbital processes, 42; breadth of palate at middle of last molar, 22.8; length of palate, 63.6; greatest length of single half of mandible, 104.

Remarks.—Among South American *Canidæ* there appears to be a wide variety of type forms that probably completely bridge over the differences between *Urocyon* and the fox-like wolves of the subgenus *Thous*. Such species as *Canis azaræ*, *C. fulvipes*, and *C. urostictus* appear to be connecting links, showing a strange mixture of characters.

I can find no notice of any species like the subject of the present description. While *U. aquilus* undoubtedly belongs in the genus *Urocyon*, it differs cranially very much from *U. cinereoargenteus*, the type of the genus. Its external characters are wholly those of *Urocyon*.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW MURINE OPOSSUM FROM MARGARITA ISLAND.

BY OUTRAM BANGS.

While on the Island of Margarita, Venezuela, in the summer of 1895, Lieutenant Wirt Robinson, U. S. Army, collected five murine opossums. Four of these he presented to the National Museum at Washington and one to me. These specimens represent a very pallid insular race that may be known as—

Marmosa robinsoni sp. nov.

Type from Margarita Island, Venezuela, ♂ adult, No. 7749, coll. of E. A. and O. Bangs. Collected July 12, 1895, by Lieut. Wirt Robinson, U. S. Army. Orig. No. 506.

General characters.—Similar to *M. murina*, but much paler and more yellow; black mark through eye less extensive; ear (in dried skins) considerably smaller; skull similar to that of *M. murina*.

Color.—Upper parts, clay color, becoming paler and more yellowish on sides; sides of neck and top of nose back to between eyes dull buffy yellow; black mark through eye less extensive and duller than in *M. murina*. Under parts, dull straw yellow to base of hairs; line of demarkation between colors of upper and under parts much less distinct than in *M. murina*; feet and hands dull yellowish white.

Measurements.

Number.	Sex.	Total length.	Tail vertebrate.	Hind foot.
7749*	♂ adult	374.9	203	
63209†	♂ adult	370.8	210.8	24.13
63210	♀ adult	320	175.3	

* Coll. of E. A. and O. Bangs.

† Coll. of National Museum, Washington.

Remarks.—This insular murine opossum, which I have named in honor of its discoverer, may be readily distinguished from *M. murina* by its much paler, more yellow color and smaller ear. With *M. murina mexicana*, *M. robinsoni* agrees in having the middle of the face back to the eyes decidedly paler than the rest of the upper parts and in having small ears. It differs from *M. mexicana* quite as much in color as it does from true *murina*, and can be told at a glance from either.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW RABBIT FROM MARGARITA ISLAND, VENEZUELA.*

BY GERRIT S. MILLER, JR.

The small collection of mammals taken on Margarita Island, Venezuela, by Lieut. Wirt Robinson during the summer of 1895 proves to be exceptionally rich in novelties. Of the six species that it contains, two † have already been described in these Proceedings as new, while I now find that a third, the rabbit previously recorded as *Lepus brasiliensis*, differs specifically from its mainland representative. It may stand as:

Lepus margaritæ sp. nov.

Lepus brasiliensis Robinson, Proc. U. S. National Museum, XVIII, p. 651.

Type No. 63217, United States National Museum, ♂ adult, collected on Margarita Island, Venezuela, July 1, 1895, by Lieut. Wirt Robinson, U. S. Army. Original number 369.

General characters.—In size, cranial characters, and general appearance most like *Lepus cumanicus* Thomas ‡ of the adjacent mainland, but with under side of tail dull yellowish brown instead of white, rump strongly suffused with rufous, and sides of head without conspicuous black spot between eye and base of ear.

Color.—General color of back and sides a conspicuous grizzle of blackish brown and pale whitish buff, the buff slightly paler on sides, and the black somewhat heavier on back. Soft, woolly under fur light plum-

* Published by permission of the Secretary of the Smithsonian Institution.

† *Rhogeëssa minutilla* Miller, and *Marmosa robinsoni* Bangs.

‡ Ann. and Mag. Nat. Hist., 6th ser., XX, p. 552, December, 1897.

beous. Shoulders, rump, upper surface of tail and outer sides of all four legs strongly suffused with rufous. Nape patch clear rufous. Crown essentially like back, only more finely grizzled and the buff darker. Whole side of head light gray, shaded with dark brown, the gray clearer around eye (where it forms an indistinct ring) and on sides of muzzle, the brown most conspicuous on cheeks below and behind eye. Whole under parts, with the exception of a broad buffy collar, dull white, faintly darkened by the plumbeous bases of the hairs. The white extends on inner side of front legs to wrists and on hind legs to base of claws. Tail colored like the rump, slightly paler and less rufous ventrally than dorsally.

Measurements.—Total length (skin), 350; length to end of outstretched hind feet, 445;* tail to end of hairs, 35.6;* hind foot, 86; ear from crown, 70; width of ear, 38. Skull: greatest length, 79; basilar length, 61; zygomatic breadth, 36.4; nasals, length 36.8; combined width, 18; incisive foramen, 12.4 x 7.4; maxillary tooth row (alveoli), 15; mandible, 58; mandibular tooth row (alveoli), 15.

General remarks.—Were it not for its longer ears, slightly smaller size, and short, dark colored tail, *Lepus margaritæ* would bear a very strong superficial resemblance to *L. sylvaticus transitionalis* Bangs. Its relationships, however, are, as already pointed out, with its nearest geographical ally, *L. cumanicus.*

* From fresh specimen by collector.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

THE EARLIEST GENERIC NAME FOR THE NORTH AMERICAN DEER, WITH DESCRIPTIONS OF FIVE NEW SPECIES AND SUBSPECIES.

BY C. HART MERRIAM.

For many years the generic name *Cariacus* Lesson, 1842, stood unchallenged for our Virginia Deer and its allies. In February, 1895, Mr. Oldfield Thomas reinstated Gloger's *Dorcelaphus*, as having one year priority, but stated that it was by no means clear that this name would stand, since it was antedated. he was informed by Dr. T. S. Palmer, by two of Rafinesque's names—*Panallodon*, 1831, and *Odocoileus*, 1832. I have not been able to see a copy of the rare publication in which Rafinesque's *Panallodon* appeared. It is entitled 'Enumeration and Account of some remarkable natural objects of the Cabinet of Professor Rafinesque, in Philadelphia,' and is said to have been published in Philadelphia in November, 1831. In a review in 'The Monthly American Journal of Geology and Natural Science' for May, 1832 (Vol. I, No. 11, pp. 509–510), it is said that *Panallodon* "owes its existence to a jawbone, six inches long, found in a Solar temple in Kentucky. He [Rafinesque] thinks this akin to mazama, which was somewhat similar to the antelopes, but having teeth 'more like some carnivorous animals, but no canine tooth.'" Apart from the insufficiency of the diagnosis, the small size of the jaw and character of the teeth indicate that the animal could not have been a deer.

Rejecting *Panallodon* as untenable, the name next in order of

date is *Odocoileus*.* This name was based on the second or third (probably the third) left upper premolar of the Virginia deer, or a closely related form, found in a cave near Carlisle, Pennsylvania. Fortunately there is no room for doubt as to the animal to which the tooth belonged, for Rafinesque described it in detail and published natural-size figures of both outer and inner faces of the tooth. Since the name *Odocoileus* was published 9 years earlier than *Dorcelaphus* of Gloger, and 10 years earlier than *Cariacus* Lesson, it appears to be the earliest generic name for the American deer of which *O. speleus* Raf. [= *O. virginianus* (Bodd.)] is the type species. The earliest generic name for the South American deer of the group typified by *Cervus rufus* I have previously shown to be *Mazama* Rafinesque, 1817.†

Five new deer in the collection of the Biological Survey are here described: Two of these, one from Sitka, Alaska, the other from southern California, are northern and southern representatives of the Columbia Blacktail (*Odocoileus columbianus*), to which they are closely related; the third, from Cerros Island, Mexico, is a strongly marked insular species of the Mule Deer group, of which *Odocoileus hemionus* is the type. The remaining two, from southern Mexico, appear to be very distinct.

Odocoileus columbianus sitkensis subsp. nov.

Type from Sitka, Alaska, No. 74383, ♀ im., U. S. Nat. Mus., Biological Survey Coll. Collected Aug. 8, 1895, by C. P. Streator. Original No. 4767.

Characters.—Similar to *O. columbianus*, but smaller, with smaller skull and teeth, and much shorter ears (in type: from anterior base 125; from notch 105); black of upper side of tail replaced on basal half with fulvous hairs, like those of back.

Color.—Type specimen at end of summer (with patches of gray winter coat coming in irregularly through worn red summer coat): upper parts from forehead to base of tail, including outer sides of legs and feet, fulvous; face grizzled gray, becoming pale dull fulvous inferiorly; eyelids black; a V-shaped mark extending from eyes half way to nose, dusky; space between eyes grizzled fulvous and black; ears grizzled gray and dusky, not becoming blackish anteriorly; inside of ears white. Chin and under lip, except bar between angles of mouth, white; posterior part of belly, inguinal region, inner side of thigh, and a disconnected strip along posterior aspect of foreleg, white; throat grayish fulvous; rest of under

* Atlantic Journal, vol. I, No. 3, p. 109, "Autumn of 1832."

† Science, NS, I, 208, Feb. 22, 1895.

parts pale fulvous; tarsal gland blackish in middle, surrounded by fulvous. Tail: above, basal half fulvous like back; terminal half (except white tip) black; under side white, the white at tip showing from above.

Cranial characters.—Skull similar to that of *columbianus*, but somewhat smaller; tooth row shorter; lachrymal pit short and very deep; anteorbital vacuity relatively small.

Odocoileus columbianus scaphiotus subsp. nov.

Type from Laguna Ranch, Gabilan Range, Calif., No. 65162, ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected April 24, 1894, by J. E. McLellan. Orig. No. 797.

Characters.—Similar to *O. columbianus*, but ears very much larger; coloration paler.

Color.—Type specimen in worn winter pelage (April 24): upper parts uniform grizzled gray; under parts with white areas as in *columbianus;* ears longer and *very much broader* than those of *columbianus.*

Cranial characters.—Skull similar to that of *columbianus*, but lachrymal pit narrower and more elongate anteriorly; anteorbital vacuity much larger; teeth larger and heavier.

Measurements.—Type specimen (in flesh): Total length 1465; tail vertebræ 135; hind foot 452. Ear in dry skin: length from anterior base 178; from notch 168; breadth 106.

Odocoileus cerrosensis sp. nov.

Type from Cerros (or Cedros) Id. off Lower California, Mexico, No. 80782, ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected August 9, 1896, by A. W. Anthony.

Characters.—Similar in general to the California Mule Deer, *Odocoileus hemionus californicus*, but smaller.

Color.—Upper parts dark grizzled gray with scattered hairs of pale fulvous; a blackish band along median line from occiput to rump and on upper surface of tail, usually but not always interrupted on rump; muzzle grayish-white, becoming gray on sides of face; a small dusky spot on top of nose close to nose pad, and another on each side just behind nostril; a dark transverse band between eyes anteriorly, curving back over eyes and reaching posteriorly to behind plane of eyes, thus forming a broadly U-shaped mark; ears grizzled gray with a darker area on anterior face just above middle; inside of ears white; under lip and chin whitish, with a small elongate black spot on each side of middle of lip, and a small dark triangle on middle of chin; throat and neck dark dusky gray, becoming blackish between forelegs and along middle of breast: sides of breast and belly grizzled gray like back; inguinal region and posterior third of middle of belly whitish, becoming buffy on thigh and reaching down on inner side of leg a little below heel; posterior aspect of forelegs and feet buffy; rest of legs and feet buffy fulvous. Tail: basal two-thirds whitish, usually with dark band above; terminal third abruptly

blackish and enlarged, and with some fulvous hairs on upper side. Tarsal gland normal, on inner side of calcaneum; metatarsal gland about 75-80 mm. in length, occupying approximately middle third (really a little above middle third) of outer side of metatarsus.

Cranial characters.—Skull similar in general to that of *O. hemionus californicus* but smaller and lighter, with *decidedly longer nasals* and very *much smaller teeth*. The nasals are very narrow anteriorly, and are produced so far posteriorly as to reach within 3 or 4 mm. of plane of hinder border of anteorbital vacuities. The postero-lateral edge of the nasals abutting against the anteorbital vacuity is nearly straight and so elongated that its length equals the combined breadth of nasals on fronto-nasal suture. The lachrymal pit is deep, but less so than in *O. h. californicus*. The anteorbital vacuity is decidedly larger than in *californicus;* the orbitosphenoid decidedly narrower, and the anterior (sublachrymal) extension of the jugal equally broad. The external openings of both of the lachrymal ducts are on the inner side of the orbital rim.

Antlers.—The antlers are small, well bowed outward, with incurved tips, and have only a single branch which is given off from the upper third of the main tine and projects backward and upward. The largest antler of five apparently adult bucks in the collection measures only 190 mm. from burr to tip in a straight line; the spread between the tips is 230; greatest spread at base of incurved tips 260.

Measurements.—Type specimen, measured from dry skin: Total length 1560; tail vertebræ 180; hind foot 380; ear from crown anteriorly 180.

Odocoileus thomasi sp. nov.

Type from Huehuetan, Chiapas, Mexico, No. 77866, ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected Feb. 22, 1896, by E. W. Nelson and E. A. Goldman. Orig. No. 9359.

Characters.—Size rather large; *color red all the year round;* tail as in the Virginia Deer; metatarsal gland a very small spot on postero-external aspect of metatarsus about midway between calcaneum and hoofs.

Color.—*Winter pelage* (type specimen): Upper parts including side of belly, middle of breast and neck all round, fulvous, becoming bright grizzled golden fulvous on back; muzzle grayish dusky; forehead mixed fulvous and black, becoming solid black in front of plane of ears, with a fulvous spot over each eye posteriorly; chin white with a black spot on each side of middle of lip, the spots nearly meeting on median line; inguinal region, inner side of thighs, middle part of belly, and posterior aspect of forelegs, white. Tail: upper surface bright fulvous; under surface white. *Summer pelage* (Tonala, Chiapas, Aug. 10): Similar, but upper parts simply fulvous, lacking the grizzled golden appearance of winter pelage; forehead fulvous like rest of upper parts (lacking the black of winter); muzzle dark grayish with a small dusky spot just behind nose pad and another behind each nostril. [It is possible that the Tonala specimen is not *O. thomasi*.]

Cranial characters.—Skull and teeth similar in general to those of *Cariacus clavatus* True [= *Odocoileus truei*]* from Honduras but somewhat larger, skull broader, nasals shorter, anteorbital vacuities larger; antlers larger (about 120 mm. long) and in one specimen (from Tonala, Chiapas) developing a short prong on inner side midway of the length of the tine.

The skull of an old buck (No. 74885), with mature antlers in the velvet, was collected by Mr. Nelson at Santa Efigenia, Oaxaca, July 21, 1895. The antlers are unlike those of any deer known to me, and I incline to the belief that they are those of *O. thomasi* when full grown. They measure 200 mm. in straight line from burr to tip and 240 over curve, and slope directly backward almost on plane of face, the tips curving inward and slightly forward (spread between tips 110; greatest spread 165). They give off a spike on inner side about 60 mm. from burr, which curves inward and forward (agreeing with curvature of beam) and reaches back about 110 from burr. These spikes are symmetrical on the two sides and their incurving tips are only 50 mm. apart. The left beam gives off posteriorly a prong 70 mm. below the tip and 50 mm. in length, which is directed backward and slightly inward. The burrs are very large and, with the basal part of the beams, very rugose. The skull bearing these antlers is somewhat smaller than the type of *thomasi*, and the rostrum and nasals are narrow, as usual in old age. The flesh measurements of this animal were: Total length 1400; tail vertebræ 165; hind foot 378; height at shoulder 780.

Measurements.—Type specimen: Total length 1544; tail vertebræ 153; hind foot 425.

Odocoileus nelsoni sp. nov.

Type from San Cristobal, highlands of Chiapas, Mexico. No. 76201, ♂ 2d year, U. S. Nat. Mus., Biological Survey Coll. Collected Oct. 1, 1895, by E. W. Nelson and E. A. Goldman. Orig. No. 8524.

Characters.—Size medium; color dark brownish gray, with top of head and dorsal band blackish; antlers (2d year) small sub-cylindrical spikes 65 mm. in length.

Color.—Upper parts dark grizzled brownish-gray, the tips of hair becoming pale fulvous posteriorly; a black stripe from nose pad to forehead, bifurcating and sending a narrow band over each eye in type specimen leaving top of head grizzled gray and black [in another specimen whole top of head blackish, the difference probably seasonal]; a blackish dorsal band from top of head to middle of back on rump; ears grizzled gray; tail like that of Virginia Deer; fulvous above, white below. A black band

* In 1888 Mr. F. W. True described a new deer from Honduras under the name *Cariacus clavatus*. But the specific name *clavatus* for a deer of this group is preoccupied by *Cervus clavatus* Ham. Smith (in Griffith's Cuvier, Animal Kingdom, V, 315, 1827). Hence it is necessary to rename Mr. True's deer, which I take pleasure in doing in honor of its describer. It may be known as *Odocoileus truei*.

across white chin; sides of face and neck all round dark grizzled gray, becoming dusky between forelegs; axillary and inguinal regions, posterior aspect of forelegs and inner side of thigh white; sides of belly and legs pale grayish-fulvous. Metatarsal gland a small spot 10 mm. long surrounded by white hairs, on outer side of metatarsus midway between end of calcaneum and tip of hoof. Tarsal gland normal.

Cranial characters.—Skull small and light with short nasals, small anteorbital vacuities, shallow lachrymal pits, broad anterior (sublachrymal) extension of jugals, broad orbitosphenoids, and remarkably small and narrow audital bullæ. The skull and teeth resemble those of *O. acapulcensis* more closely than they do any other deer known to me, but may be distinguished from *acapulcensis* by the shortness of the nasals, great breadth of the orbitosphenoid anteriorly and of the anterior extension of the jugal, and the small size of the audital bullæ.

Measurements.—Type specimen, ♂ of 2d year, not full grown; measured in flesh: Total length 1250; tail vertebræ 170; hind foot 360. Height at shoulder 650. Ear in dry skin: from anterior base 140; from notch 120.

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PROCEEDINGS

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BIBLIOTECA MARINA

DESCRIPTIONS OF TWO NEW SUBGENERA AND THREE NEW SPECIES OF *MICROTUS* FROM MEXICO AND GUATEMALA.

BY C. HART MERRIAM.

Among the mammals collected in Mexico and Guatemala by Mr. E. W. Nelson and his assistant, Mr. E. A. Goldman, are 462 specimens of Voles of the genus *Microtus*. These animals were found on most of the mountains visited and series were obtained at 34 localities.

Up to the present time only three species of *Microtus* have been described from Mexico, namely, *mexicanus* (Saussure), from Mt. Orizaba, *phæus* (Merriam), from the Sierra Nevada de Colima, Jalisco, and *quasiater* (Coues), from Jalapa, Vera Cruz. *M. mexicanus* and *phæus* belong to the subgenus *Microtus*; *M. quasiater* to the subgenus *Pitymys*. Mr. Nelson's collection contains large series of topotypes of these three species, and additional specimens from numerous new localities; it contains also three new species, one of which (*fulviventer*) belongs to the subgenus *Microtus* proper; the others differ so widely from the previously known groups and from each other that it is necessary to erect two new subgenera for their reception. The two animals agree in the character of the fur, which is long and soft, and in the number of closed triangles on the first and last lower molars; they differ in the enamel pattern of the last upper molar, the degree of inflation of the triangles and loops of all the teeth, and in striking cranial characters. One is a long-tailed vole from Mt. Zempoaltepec, Oaxaca; the other a short-tailed animal

from Todos Santos, Guatemala. Both localities are considerably farther south than the southernmost published record of any member of the genus.

Subgenus MICROTUS Schrank.

Type, *Microtus arvalis* (Pallas) from Europe.

Microtus fulviventer sp. nov.

Type from Cerro San Felipe, Oaxaca, Mexico (alt. 10200 ft.). No. 68250, ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected Aug. 22, 1894, by E. W. Nelson and E. A. Goldman. Orig. No. 6601.

Characters.—Similar to *M. mexicanus* in size and general characters, but upper parts very much 'redder' and under parts fulvous instead of whitish; tail short; ears conspicuous.

Color.—Upper parts uniform dark umber brown mixed with black hairs; under parts dark fulvous or chestnut-fulvous; tail indistinctly bicolor, blackish above, pale fulvous below, darkening toward tip.

Cranial and dental characters.—Skull and teeth similar to those of *M. mexicanus*, but slightly larger; interorbital region broader; incisive foramina longer; molars heavier.

Measurements.—Type specimen: Total length 154; tail vertebræ 38; hind foot 20.

Subgenus ORTHRIOMYS* nobis.

Type, *Microtus umbrosus* sp. nov., from Mt. Zempoaltepec, Oaxaca, Mexico.

Characters.—Palate normal; interorbital constriction rather broad; m_1 with 3 closed triangles (2 on inner and 1 on outer side) and 2 open triangles, the latter forming the wings of the anterior trefoil; m_3 with 2 completely closed triangles (1 on each side) and 2 obliquely transverse loops (anterior and posterior) both on inner side; the outer triangle immediately followed by a deep reëntrant angle which completely cuts it off from inner triangle; m^1 with 1 closed triangle on each side. Mammæ 4: pectoral $\frac{2}{2}=4$. Fur long and soft, only extreme tip colored.

Remarks.—In the type and only known species, *M. umbrosus*, m^1 has only 2 closed triangles and a posterior open trefoil; the molars are very broad and heavy, the breadth relatively greatest posteriorly; the enamel loops and triangles are very large, full, and broadly rounded, enclosing large islands of dark osteodentine, and so crowded as to exceed the interspaces. The crowns of the molars resemble those of *Phenacomys* in the polish of the enamel, darkness of the osteodentine and of the crowns as

* ὄρθριος, early; μῦς, mouse. In many respects *Orthriomys* suggests an ancient type intermediate between *Phenacomys* and the microtine subgenera *Pedomys* and *Arricola;* in the character of its molar crowns it is nearest *Phenacomys*.

a whole (contrasted with the whitish molars of *Microtus*); large size and fullness of the loops and triangles (in this respect exceeding *Phenacomys*); pyriform shape of anterior loop in m^2 and m^3; enamel pattern of upper molars, including m^3; only slightly modified enamel pattern of lower molars, and great breadth of molar series (above and below) posteriorly. They differ from those of *Phenacomys* in having the outer triangle of m_3 completely isolated; two less triangles on m_1, less disparity in depth between the reëntrant angles of the two sides in the lower molars, and in the total absence of roots.

Microtus umbrosus sp. nov.

Type from Mt. Zempoaltepec, Oaxaca (alt. 8200 ft.). No. 68480, ♀ ad., U. S. Nat. Mus., Biological Survey Coll. Collected July 10, 1894, by E. W. Nelson and E. A. Goldman. Orig. No. 6412.

Characters.—Size medium or rather large; tail long and scantily haired; ears rather short and nearly concealed by fur; color very dark; fur long, soft, and full; dentition peculiar.

Color.—Upper parts uniform dusky with tips of hairs brown; under parts dark slate, washed with pale dull fulvous.

Cranial and dental characters.—Skull rather long; braincase long; anterior roots of zygomata not notched in front; zygomata not widely spreading, sides parallel; jugal not expanded; audital bullæ small; palatine pits deep; postpalatal notch square; interorbital constriction broad; premaxillæ reaching posteriorly considerably beyond nasals; nasals narrowing posteriorly; incisive foramina rather short. Molars large and broad; m^3 with 1 closed triangle on each side, and a short posterior trefoil or v presenting one open salient angle on each side [remaining teeth described under subgenus].

Measurements.—Type specimen: Total length 184; tail vertebræ 65; hind foot 23. Average of 7 specimens from type locality: Total length 177; tail vertebræ 61; hind foot 23.5.

Subgenus HERPETOMYS * nobis.

Type, *Microtus guatemalensis* sp. nov., from Todos Santos, Guatemala.

Characters.—Palate normal; m_1 with 3 closed triangles (2 on inner and 1 on outer side) and 2 open triangles, the latter forming the wings of the anterior trefoil; m_3 with 2 completely closed triangles (1 on each side) and 2 obliquely transverse loops (anterior and posterior) both on inner side; m^3 with 3 closed triangles (2 on outer and 1 on inner side) and a long posterior crescentic loop with both horns projecting on inner side. Mammæ 6: pectoral $\frac{2}{2}$, inguinal $\frac{1}{1}$ (the latter not functional). Plantar tubercles 5. Fur long and soft with only extreme tip colored.

Remarks.—This animal, while agreeing with *Orthriomys* in the number of enamel loops and triangles of the lower molars, differs strikingly in

* ἕρπης, ἕρπητος, creeper; μῦς, mouse.

those of the last upper molar (which agrees with *Microtus* proper) and in the general appearance of the molar crowns, which resemble *Microtus* instead of *Phenacomys*.

Microtus guatemalensis sp. nov.

Type from Todos Santos, Huehuetenango, Guatemala (alt. 10000 ft.). No. 76777, ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected Dec. 30, 1895, by E. W. Nelson and E. A. Goldman. Orig. No. 8960.

Characters.—Size medium; coloration very dark; end of nose blackish; lips white; tail short and rather scantily haired; fur very long and soft, nearly hiding the ears.

Color.—Under parts everywhere slate black; extreme tips of hairs on upper parts mixed dark golden fulvous and black, the resulting color difficult to describe but near the 'mummy brown' of Ridgway's 'Nomenclature of Colors'; end of nose surrounding nose pad blackish; edges of lips white; tail concolor, blackish.

Cranial and dental characters.—General appearance of skull as in *Microtus pennsylvanicus* or *mexicanus* but less constricted interorbitally; audital bullæ very large and swollen; jugal rather broadly expanded vertically; incisive foramina very rectangular—of nearly equal breadth throughout and truncate at both ends; anterior root of zygoma rather strongly notched in front and standing out squarely so that the jugals are nearly parallel. Dentition peculiar: incisors broad and long; molars broad and heavy: m^3 with 2 completely closed triangles on outer and 1 on inner side, with open posterior loop elongated and curved to form 2 salient angles on inner side.

Measurements.—Type specimen: Total length 155; tail vertebræ 40; hind foot 21. Average of 20 specimens from type locality: Total length 150; tail vertebræ 37; hind foot 21.

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PROCEEDINGS

OF THE

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RANDOM NOTES ON THE NOMENCLATURE OF THE CHIROPTERA.

BY T. S. PALMER.

A careful examination of the names of bats now in common use shows that many changes must be made before the nomenclature will be placed on a stable basis. Some of these changes have already been pointed out by Miller in his recent revision of the Vespertilionidæ.* But errors no less glaring still pass current in other families, and it is the purpose of this paper to call attention to a few which have come to light while compiling a list of the family and generic names of Chiroptera.

Bats are now usually divided into six families: Emballonuridæ, Nyeteridæ, Phyllostomatidæ, Pteropodidæ, Rhinolophidæ, and Vespertilionidæ. A rigid adherence to the rule of priority requires a change in at least two of these names, as well as in the designations of several subfamilies, genera, and species.

NOCTILIONIDÆ (Emballonuridæ).

The free-tailed bats received the commonly accepted name of Emballonuridæ from Dobson in 1875.† Gray, however, in 1821‡

*North American Fauna, No. 13, 1897; Ann. & Mag. Nat. Hist., 6th ser., XX, p. 379, 1897. Most of the references to generic and specific names were furnished Mr. Miller by the Biological Survey of the U. S. Dept. of Agriculture, the generic names forming part of my forthcoming index to the genera of mammals.

†Ann. & Mag. Nat. Hist., 4th ser., XVI, p. 347, Nov., 1875.

‡London Medical Repository, XV, p. 299, Apr. 1, 1821.

proposed the term Noctilionidæ based on another genus of the same family, and this name having priority of more than half a century should be adopted instead of Emballonuridæ.

The genus *Saccopteryx*, according to Dobson, contains 4 subgenera, one of which, *Centronycteris*, was based on *Vespertilio calcaratus* from Brazil. This species was named by Wied in 1821,* but is preoccupied by *Vespertilio calcaratus* Rafinesque† described in 1818, a North American species belonging to another family. Since the Brazilian bat now known as *Saccopteryx calcarata* does not seem to have received any other specific name, it may be called **Saccopteryx wiedi** in honor of its discoverer, Maximilian, Prince of Wied.

MEGADERMATIDÆ (Nycteridæ).

The family Nycteridæ, also named by Dobson in 1875, contains but two genera, *Megaderma* and *Nycteris*, each the type of a distinct subfamily. Harrison Allen published the name Megadermatidæ in 1864‡; Peters used the term Megadermata as early as 1865, and Gill adopted it in a modified form Megadermidæ, in 1872. Although Harrison Allen merely used the name incidentally for a genus which is now known to belong to another group, there can be no doubt as to the genus on which it was based. Consequently there seems to be no reason why Megadermatidæ should not be adopted for the family, since it has 11 years' priority over Nycteridæ.

PHYLLOSTOMATIDÆ.

Several changes in current generic names of leaf-nosed bats are also necessary. *Anoura* Gray, 1838, should replace *Glossonycteris* Peters, 1868, as recently shown by Thomas and Trouessart; *Phylloderma* may be antedated by *Guandira*; and *Lophostoma* must give way to *Tonatia*. The Cayenne Bat, called *Phylloderma stenops* by Peters in 1865,§ was previously named *Guandira cayanensis* by Gray in 1843, but apparently was not described until 1866‖

* Schinz, Das Thierreich, I, p. 180, 1821.

† Am. Monthly Mag., III, p. 445, Oct., 1818.

‡ Mon. Bats North Am., p. XXIII, 1864.

§ Monatsber. K. Preuss. Akad. Wiss., Berlin, p. 513, 1865.

‖ List Spec. Mamm. Brit. Mus., p. 194, 1843; Proc. Zool. Soc. London, 1866, p. 114.

and therefore remained a nomen nudum until one year after the appearance of Peters' description. If Gray has anywhere described the species prior to 1866, his name *Guandira* will of course take precedence over *Phylloderma*.

Lophostoma D'Orbigny,* is antedated at least nine years by *Tonatia* Gray, 1827. *Lophostoma* was based on *L. sylvicolum* (= *Phyllostoma amblyotis* Wagner, 1843), and according to Dobson, contains two other species—*Vampyrus bidens* Spix and *Lophostoma brasiliense* Peters. *V. bidens*, however, is the type of *Tonatia* Gray. The genus was published in volume V of Griffith's Cuvier, Animal Kingdom, as follows: "*Vampyrus*, it is understood, was long ago appropriated by M. Geoffroy (in a MS. communication to Dr. Leach) as a generic name to *V. spectrum* of Linnæus; but Spix in his splendid work on the animals of Brazil, now publishing, has adopted it for three species there described, the *Cirrhosus*, *Soricinus*, and *Bidens*. * * * Mr. Gray proposes * * * to divide the three species of Spix's genus *Vampyrus* above mentioned into two genera, the one under the name *Istiophorus*, including *Cirrhosus* and *Soricinus*, and the other under that of *Tonatia*, including *Bidens* only."†

PTEROPODIDÆ.

Among the fruit-eating bats, changes are inevitable in the well-known genera *Macroglossus* (or *Carponycteris*), *Cynonycteris* (or *Xantharpyia*), *Harpyia*, and *Cephalotes*. *Macroglossus*, preoccupied in Entomology, was replaced in 1891 by *Carponycteris*, Lydekker. This latter name is antedated by *Kiodotus*, proposed in 1840 by Blyth,‡ who had previously discovered that *Macroglossus* was not available, and suggested a Latinized form of the common name as a substitute. The adoption of *Kiodotus* necessitates a new name for the subfamily Macroglossinæ or Carponycterinæ, which may be called **Kiodotinæ**. This subfamily includes the

* First published on plates of D'Orbigny's 'Voyage dans l'Amerique meridionale,' which were distributed separately in 1836. In 1838 Gray quoted the genus with a brief diagnosis, merely mentioning the species by name. The specific name, however, dates from 1847, the year when the text accompanying the plates appeared.

† P. 71, foot-note, 1827.

‡ Cuvier's Animal Kingdom, 69 footnote, 1840; new ed., 69 footnote, 1849. The first edition not seen; Mr. F. H. Waterhouse, Librarian of the Zoölogical Society of London, has kindly verified the reference for me.

genera *Callinycteris*, *Eonycteris*, *Kiodotus*, *Melonycteris*, *Nesonycteris*, *Notopteris*, and *Trygenycteris*.

The genus known as *Cynonycteris* by Peters and Dobson, and as *Xantharpyia* by Lydekker, must give way to *Rousettus* Gray, 1821,* which has more than 20 years' priority. *Rousettus* was based on *Pteropus aegyptiacus; Xantharpyia* Gray, 1843, included *P. amplexicaudatus*, *P. aegyptiacus*, and *P. stramineus;* and *Cynonycteris* Peters, 1852, had for its type *P. collaris*. As all these species are now considered congeneric, it is simply a matter of selecting the earliest name.

Harpyia is preoccupied in Entomology, and in the case of *Cephalotes* an unfortunate transfer of the name must be made similar to that of *Vespertilio*, to which Miller has already called attention. *Cephalotes* and *Harpyia* are closely related, and may therefore be considered together. *Cephalotes* was proposed by Geoffroy in 1810† for two species, *Cephalotes peronii* Geoffroy, from the island of Timor, and *Cephalotes pallasii* Geoffroy, a new name for *Vespertilio cephalotes* Pallas. Illiger in the following year, 1811, based his *Harpyia* on *Vespertilio cephalotes*. But, as already stated, *Harpyia* is preoccupied in Entomology, since Ochsenheimer selected it in 1810 for a group of European moths and gave a detailed description of the genus and several species in his work entitled 'Die Schmetterlinge von Europa' (vol. III, p. 19). *Harpyia* is therefore not available either for the bat or the eagle, to which it has so long been applied. Even were this not the case, it could hardly claim recognition, as it is in reality merely a synonym of *Cephalotes*.

It may be claimed that Geoffroy did not name the type of his genus *Cephalotes*, and under the rule that the first reviser of a genus has the right to fix the type when none has been designated by the original describer, Illiger could select *Vespertilio cephalotes* as the type of *Harpyia* (thus leaving *Cephalotes peronii* as the type of the genus *Cephalotes*), and his verdict would be final. Certain it is that he has been followed by Temminck, Gray, Dobson and others, until *C. peronii* has become almost universally associated with *Cephalotes* and *V. cephalotes* with *Harpyia*. It may well be questioned whether the type of *Cephalotes* was really left in uncertainty, and whether Illiger deliberately

* London Medical Repository, XV, p. 299, Apr. 1, 1821.

† Ann. Mus. d'Hist. Nat. Paris, XV, pp. 101–108.

'fixed' it, or, not having seen Geoffroy's paper,* simply based *Harpyia* on *Vespertilio cephalotes*, which he recognized as distinct from other species of *Vespertilio*. The original description seems to leave little doubt that Geoffroy intended *cephalotes* and not *peronii* as the type of his genus, for he says: "Nous donnons ce nom à la céphalote de Pallas et à une nouvelle espèce du voyage aux terres australes, qui ont une trés-grande affinité avec les rousettes, mais qui en diffèrent assez pour ne pouvoir être comprises dans le même genre" (p. 101). Again: "Pallas m'a fourni le nom de céphalote" (p. 104). If this is not conclusive, it is only necessary to refer to Isidore Geoffroy's explanation of the case,† in which he calls attention to Illiger's transposition of the type, stating that *Vespertilio cephalotes* was actually the type of *Cephalotes*, and that Geoffroy afterwards perceiving that *cephalotes* and *peronii* were generically distinct proposed *Hypoderma* for the latter species. He says: "Ce genre [*Cephalotes*], établi par Geoffroy Saint-Hilaire, a pour type une espèce très-remarquable par son système dentaire, le *Vespertilio Cephalotes* de Pallas. * * * Depuis cette époque, de nouvelles observations ont démontré la nécessité de séparer ces deux Chauve-Souris, semblables à quelques égards, mais différant l'une de l'autre par de nombreux et importans caractères. Cette séparation a été effectuée par Geoffroy dans un travail publié tout récemment (Leçons sténog.), où le groupe peu naturel des Céphalotes est partagé en deux genres, l'un conservant le nom de *Cephalotes*, c'est celui qui a pour type le *Vespertilio Cephalotes;* l'autre nommé *Hypoderma*, c'est celui qui a pour type la Céphalote de Péron. * * * Quelques auteurs, ayant déjà senti la nécessité de séparer les deux Céphalotes, ont proposé de donner le nom d'*Harpya* créé par Illiger, a la véritable Céphalote, le *Vespertilio Cephalotes* de Pallas, et de transporter le nom *Cephalotes* à l'espèce de Péron." *Hypoderma*, like *Harpyia*, is preoccupied in Entomology,‡ and since no other generic name seems to have been proposed for *Cephalotes peronii*, a new name is required for the

* Illiger does not refer to the paper or to Geoffroy's species *Cephalotes peronii*.

† Dict. Classique d'Hist. Nat., XIV, p. 706, 1828.

‡ According to Agassiz the name was proposed by Clark, in 1815, in his 'Essays on the Bots of Horses and other Animals.' I have been unable to find the name in this paper, but it was subsequently used by Latreille in 1825, in his 'Fam. Nat. du Règne Animal,' V, p. 503.

group. The genus may therefore be called **Dobsonia** in honor of the late Dr. George E. Dobson who devoted much attention to the study of the Chiroptera.

Thomas has recently adopted *Uronycteris* to replace *Harpyia*.* but this name was based on *Cynopterus albiventer* Gray, which, according to Dobson, is synonymous with *Vespertilio cephalotes*. *Uronycteris* is therefore a synonym of *Cephalotes* Geoffroy. Transferring *Cephalotes* to the species to which it really belongs, the forms usually referred to it will stand *Dobsonia peronii* (Geoff.) and *Dobsonia minor* (Dobson), while those usually placed in *Harpyia* will stand, *Cephalotes cephalotes* (Pallas) and *Cephalotes major* (Dobson).

* Novitates Zoologicæ, II, p. 163, 1895.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF TWENTY NEW SPECIES AND A NEW SUBGENUS OF *PEROMYSCUS* FROM MEXICO AND GUATEMALA.

BY C. HART MERRIAM.

The enormous collection of mice of the genus *Peromyscus* made in Mexico and Guatemala by Mr. E. W. Nelson and his assistant, Mr. E. A. Goldman, contains many novelties, some of which are here described. Two of the new species, the largest yet discovered, are separated subgenerically under the name *Megadontomys*. Seven of the others belong to a well marked group distinguished by rather large size, long, soft and very dense fur, dark color, and a general agreement in cranial and dental characters.* It is but a step from *P. guatemalensis* of this series to *totontepecus* of the *mexicanus* series, and another step covers the related *tehuantepecus* and *oaxacensis*. Three others (*felipensis*, *gratus*, and *levipes*) belong to the *truei-difficilis* group, of which *P. hylocetes* may be an aberrant member, and one (*musculoides*) is distantly connected with the *leucopus* series. Standing widely apart from all of these is *P. mekisturus*, an extraordinary long-tailed animal, perhaps arboreal, from the mountain slope at Chalchicomula, Puebla.

Subgenus MEGADONTOMYS nobis.

Type, *Peromyscus* (*Megadontomys*) *thomasi* sp. nov., from Mts. near Chilpancingo, Guerrero, Mexico.

Characters.—Size large (the two known species as large as roof rats); ears and tail long and very scantily haired; pelage long, soft, and very dense.

* The new species in the series in question are: *zahrynchus*, *guatemalensis*, *lepturus*, and the slightly divergent *megalops*, *auritus*, and *comptus*.

Skull similar in general to that of *Peromyscus*, but very large and massive; rostrum and nasals much produced, the latter expanded anteriorly and projecting far beyond incisors. Molars very large and heavy (the upper series in type species measuring 6.4 mm.), with short tubercles which wear off while the animal is still young, leaving flat crowns; 1st and 2d lower molars with a supplementary narrow enamel loop on each side; 3d lower molar with 3 salient and 2 renëtrant angles on each side. Plantar tubercles 7. Mammæ 6: pectoral $\frac{4}{4}$, inguinal $\frac{2}{2}$.

Peromyscus (Megadontomys) thomasi sp. nov.

Type from Mts. near Chilpancingo, Guerrero, Mexico (alt. 9700 ft.). No. 70142, ♂ old, U. S. Nat. Mus., Biological Survey Coll. Collected Dec. 24, 1894, by E. W. Nelson and E. A. Goldman. Orig. No 7250.

Characters.—Size very large; ears large and nearly naked; tail very long (longer than head and body) and nearly naked; whiskers large and long, reaching shoulders; hind foot very long (34 mm.); pelage long and rather coarse. Similar to *nelsoni*, but more fulvous.

Color.—End of nose black; upper parts from nose to tail fulvous, brightest and purest on cheeks and sides, darkest and abundantly mixed with black hairs on back; a blackish ring round eye; under parts white, the basal plumbeous fur showing through; pectoral region in some specimens suffused with salmon-fulvous; fore and hind feet white; ankles blackish.

Cranial and dental characters.—Skull very much elongated, particularly the rostrum and nasals; nasals produced and expanded anteriorly; supraorbital ridges strongly developed; anteorbital vacuities drawn out on side of rostrum and only slightly notching root of zygoma; interparietal very large and broad, subtriangular; incisive foramina very large; postpalatal notch broad. Molars large with flat crowns (except in young), measuring about 6.5 mm.; crown of last lower molar elongate with enamel much convoluted, presenting 3 salient and 2 reëntrant angles on each side. So far as known species are concerned, the skull of *thomasi* requires comparison with only a single species—*nelsoni*. It differs from *nelsoni* in greater massiveness, in the possession of prominent supraorbital ridges, and in the stronger development of the posterior reëntrant angle of the last lower molar.

Measurements.—Type specimen: Total length 350; tail vertebræ 188; hind foot 34. Average of 7 specimens from type locality: Total length 330; tail vertebræ 175; hind foot 32.8.

Peromyscus (Megadontomys) nelsoni sp. nov.

Type from Jico, Vera Cruz, Mexico (alt. 6000 ft.). No. 55024, ♀ ad., U. S. Nat. Mus., Biological Survey Coll. Collected July 10, 1893, by E. W. Nelson. Orig. No. 5202.

Characters.—Size large; ears large and nearly naked; tail very long and scantily haired. Similar to *thomasi*, but darker and less fulvous; skull lacking the supraorbital beads.

Color.—Upper parts grayish brown, becoming dusky on nose, around

eyes, and along middle of back; under parts white, the plumbeous basal fur showing through; wrists, ankles, and tail dusky; fore feet white; hind feet whitish strongly clouded with dusky.

Cranial characters.—Skull like that of *thomasi*, but less massive, lacking the supraorbital ridges, and with the posterior reëntrant angle on inner side of $m\frac{3}{3}$ less pronounced. In *thomasi* the supraorbital ridges slightly overhang the orbits so that they intercept the dividers in taking the interorbital breadth; in *nelsoni* the upper surface of the frontal interorbitally is so much narrower that in taking this measurement the dividers rest on the vertical plane of the orbit about 2 mm. below the top of the frontal.

Measurements.—Type specimen: Total length 302; tail vertebræ 172; hind foot 35. Average of 2 specimens from type locality: Total length 310; tail vertebræ 171; hind foot 33.5.

Peromyscus zarhynchus sp. nov.

Type from Tumbala, Chiapas, Mexico. No. 76119, ♀ ad., U. S. Nat. Mus., Biological Survey Coll. Collected Oct. 20, 1895, by E. W. Nelson and E. A. Goldman. Orig. No. 8606.

Characters.—Size very large; ears large and nearly naked; tail very long and appearing naked; hind feet long and slender; coloration dark.

Color.—Upper parts dusky, becoming seal brown on sides (sometimes chestnut fulvous on flanks); under parts whitish, the plumbeous basal fur showing through; pectoral region strongly washed with chestnut, the chestnut suffusion sometimes spreading over belly; tail (skin) dusky above, yellowish white below; fore and hind feet whitish, the latter slightly clouded.

Cranial characters.—Skull very large and long with exceedingly elongated rostrum; small audital bullæ; weak and slender zygomata; zygomata narrow anteriorly, and only slightly notched by anteorbital slit, which is drawn out on side of rostrum as in *Megadontomys*. The skull resembles that of *Megadontomys nelsoni* in size and general appearance, but is distinguishable by the much greater length of rostrum and incisive foramina, narrower interparietal, less flaring nasals, and much smaller molar teeth. It does not require close comparison with any known species.

Measurements.—Type specimen: Total length 324; tail vertebræ 176; hind foot 35. Average of 13 specimens from type locality: Total length 314; tail vertebræ 169; hind foot 35.4.

Peromyscus zarhynchus cristobalensis subsp. nov.

Type from San Cristobal, Chiapas, Mexico. No. 76109, ♀ ad., U. S. Nat. Mus., Biological Survey Coll. Collected Oct. 2, 1895, by E. W. Nelson and E. A. Goldman. Orig. No. 8536.

Characters.—Similar to *P. zarhynchus* from Tumbala, but paler and more fulvous, with slightly smaller skull.

Color.—Upper parts dusky brown, becoming dusky on nose, around eyes, and along middle of back and everywhere mixed with fulvous tipped

hairs, the fulvous predominating on cheeks and sides; under parts, feet, and tail as in *P. zarhynchus.*

Cranial characters.—Skull similar to that of *P. zarhynchus*, but slightly shorter (averaging 30–31 instead of 32–33), with braincase broader and zygomata stronger and more spreading anteriorly.

Measurements.—Type specimen: Total length 322; tail vertebræ 170; hind foot 34. Average of 10 specimens from type locality: Total length 312; tail vertebræ 166; hind foot 33.8.

Peromyscus guatemalensis sp. nov.

Type from Todos Santos, Guatemala (alt. 10,000 ft.). No. 76861, ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected Dec. 31, 1895, by E. W. Nelson and E. A. Goldman. Orig. No. 8991.

Characters.—Size medium (larger than *mexicanus*, but decidedly smaller than *zarhynchus*); tail long and scantily haired; ears medium; fur long, soft, and lax; color very dark.

Color.—Upper parts dusky, finely mixed with grayish; an ill defined blackish band from side of nose to ear; cheeks and flanks dull brownish fulvous; under parts white, the plumbeous basal fur showing through; a salmon fulvous pectoral patch; wrists and ankles blackish; fore feet white; hind feet dusky at base, then white; tail dusky, irregularly paler below (sometimes white or yellowish). Some specimens have the middle part of the back nearly black and much blackish on nose. Specimens from Pinabete, Chiapas, agree closely with those from the type locality. Specimens from Calel, Zuñil, and Volcan Santa Maria, Guatemala, are somewhat paler.

Cranial characters.—Skull and rostrum large and elongate, intermediate in size between *mexicanus* and *cristobalensis;* audital bullæ as in the latter (decidedly larger than in *mexicanus*).

Measurements.—Type specimen: Total length 273; tail vertebræ 141; hind foot 31. Average of 10 specimens from type locality: Total length 268; tail vertebræ 138; hind foot 30.5.

Peromyscus lepturus sp. nov.

Type from Mt. Zempoaltepec, Oaxaca, Mexico (alt. 8200 ft.). No. 68612, ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected July 8, 1894, by E. W. Nelson and E. A. Goldman. Orig. No. 6381.

Characters.—A miniature of *P. guatemalensis*: size small (smaller than *mexicanus*); ears medium and nearly naked; tail about as long as head and body, slender and rather scantily haired; molars large; fur long and rather soft; color dark.

Color.—Upperparts brownish with a broad dusky dorsal area, becoming brownish-fulvous on cheeks and sides; nose and ring round eye dusky; underparts, fore feet, and small spot on end of nose whitish; wrists and ankles dusky; hind feet clouded with dusky, toes white; tail dusky above, paler below. Other specimens are so much darker as to appear dusky all over when seen from above, although the sides are always more or less brownish.

Cranial and dental characters.—Skull small and short (compared with others of the series); braincase rather broadly rounded and flattened; zygomata weak and not strongly notched by anteorbital slit; audital bullæ small but slightly larger than in the decidedly larger *P. mexicanus;* molars slightly larger than in *mexicanus* and series of same length, though narrower than, in the allied but very much larger *P. guatemalensis.*

Measurements.—Type specimen: Total length 238; tail vertebræ 114; hind foot 28. Average of 5 specimens from type locality: Total length 230; tail vertebræ 112; hind foot 27.3.

Remarks.—*P. lepturus* might easily be mistaken for the young of the dark form of *mexicanus* (*totontepecus*) which also occurs on Mt. Zempoaltepec, but a glance at the skulls is sufficient to distinguish them, that of *P. lepturus* being hardly three-fourths as large as *totontepecus* while its molar teeth are even larger than those of *totontepecus.*

Peromyscus megalops sp. nov.

Type from Mts. near Ozolotepec, Oaxaca, Mexico. No. 71592, ♂ old, U. S. Nat. Mus., Biological Survey Coll. Collected March 26, 1895, by E. W. Nelson and E. A. Goldman. Orig. No. 7733.

Characters.—Size rather large; ears rather short; tail long and scantily haired; fur long and soft; coloration dark with a rich chestnut fulvous suffusion.

Color.—Upperparts finely mixed black and dark fulvous, the black predominating between ears and along back; the salmon-fulvous predominating on sides and cheeks; underparts whitish, the plumbeous basal fur showing through; pectoral region salmon-fulvous; wrists and ankles dusky; fore feet whitish; hind feet clouded.

Cranial characters.—Skull large and long, resembling that of *guatemalensis* in size and general characters but audital bullæ decidedly smaller; incisive foramina much more widely open; frontals conspicuously broader and developing a distinct supraorbital bead.

Measurements.—Type specimen: Total length 282; tail vertebræ 150; hind foot 31. Average of 5 specimens from type locality: Total length 278; tail vertebræ 147; hind foot 31.

Peromyscus auritus sp. nov.

Type from Mts. 15 miles west of Oaxaca, State of Oaxaca, Mexico. No. 68438, ♀ old, U. S. Nat. Mus., Biological Survey Coll. Collected Sept. 17, 1894, by E. W. Nelson and E. A. Goldman. Orig. No. 6795.

Characters.—Similar to *P. megalops,* but ears and audital bullæ *very much larger* and coloration duller. Similar to *P. guatemalensis,* but paler and less fulvous, and frontal much narrower between orbits.

Color.—Upper parts grayish brown, becoming dusky on sides of nose, around eyes, and on back, with a pale dull fulvous wash on cheeks and sides; under parts whitish, the plumbeous basal fur showing through; wrists and ankles dusky; fore and hind feet whitish; tail dusky above, whitish beneath.

Cranial characters.—Skull similar to that of *auritus*, but audital bullæ larger; nasals longer and more pointed posteriorly (exceeding premaxillæ), and incisive foramina less broadly open. Similar to *guatemalensis*, but frontal very much broader between orbits and with a distinct supraorbital bead.

Measurements.—Type specimen: Total length 288; tail vertebræ 148; hind foot 30.5. Average of 4 specimens from type locality: Total length 281; tail vertebræ 148; hind foot 31.5.

Peromyscus comptus sp. nov.

Type from Mts. near Chilpancingo, Guerrero, Mexico. No. 70191, ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected Dec. 24, 1894, by E. W. Nelson and E. A. Goldman. Orig. No. 7266.

Characters.—Size rather large; ears large; tail rather long and scantily haired; fur long and relatively harsh; color in winter pelage bright golden-fulvous. Similar to *P. auritus*, but pelage coarser and color much more fulvous, with much less blackish on nose and side of face, and much whiter belly.

Color.—(Adults in Dec.): Upper parts from nose to tail rich golden-fulvous, the back and rump liberally lined with black hairs; black on nose reduced to a very small spot on top and a spot at base of whiskers; blackish ring round eye very small; under parts milk-white, sometimes tinged with yellowish; wrists and ankles dusky; fore feet white; hind feet whitish, more or less clouded; tail dusky above, whitish below.

Cranial characters.—Skull like that of *auritus*, but rostrum and nasals shorter, the latter less pointed behind; molars slightly smaller.

Measurements.—Type specimen: Total length 285; tail vertebræ 150; hind foot 31. Average of 10 specimens from type locality: Total length 273; tail vertebræ 143; hind foot 30.4.

Peromyscus mexicanus totontepecus subsp. nov.

Type from Totontepec, Oaxaca, Mexico (alt. 6500 ft.). No. 68624, ♀ ad., U. S. Nat. Mus., Biological Survey Coll. Collected July 16, 1894, by E.W. Nelson and E. A. Goldman. Orig. No. 6465.

Characters.—Similar to *P. mexicanus*, but larger and darker, with slightly shorter ears and denser fur.

Color.—Upper parts dusky brown becoming dull fulvous-brown on cheeks and sides; under parts whitish, the plumbeous basal fur everywhere showing through; a salmon pectoral patch sometimes present; fore feet whitish; ankles and basal part of hind feet dusky, rest of hind feet whitish; tail dusky above, irregularly whitish or yellowish below. According to season, the prevailing color varies from dull fulvous-brown to dusky with a blackish dorsal area.

Cranial characters.—Skull like that of *mexicanus*, but interparietal and audital bullæ averaging larger, and anterior root of zygoma even less notched by anteorbital slit.

Measurements.—Type specimen: Total length 261; tail vertebræ 136;

hind foot 28. Average of 10 specimens from type locality: Total length 254; tail vertebræ 130; hind foot 28.6.

Remarks.—This animal is only a mountain form of *mexicanus*, which it closely resembles. It differs far more from the geographically nearer *mexicanus orizabæ* than from true *mexicanus*.

Peromyscus mexicanus saxatilis subsp. nov.

Type from Jacaltenango, Huehuetenango, Guatemala. No. 77296, ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected Dec. 19, 1895, by E. W. Nelson and E. A. Goldman. Orig. No. 8824.

Characters.—Similar to *P. mexicanus*, but paler, upper parts more distinctly lined with black hairs, under parts whiter.

Color.—Upper parts grayish fulvous (in some specimens fulvous), everywhere conspicuously lined with black hairs, which on middle of back form a distinctly darker area; cheeks and sides fulvous, usually pale; face between eyes grayish, slightly tinged with pale fulvous and grizzled by dark hairs; end of nose (except whitish tip), patch at base of whiskers, and narrow ring round eye blackish; under parts, including lips, wrists, and fore feet, white; ankles dusky; hind feet white; tail dusky above, irregularly whitish or yellowish below.

Cranial characters.—Skull like that of *mexicanus*, but with even less distinct supraorbital beads, smaller incisive foramina, and smaller molars.

Measurements.—Type specimen: Total length 238; tail vertebræ 122; hind foot 27.5. Average of 10 specimens from type locality: Total length 245.5; tail vertebræ 127.5; hind foot 27.5.

Peromyscus mexicanus orizabæ subsp. nov.

Type from Orizaba, Vera Cruz, Mexico (alt. 4200 ft.). No. 58197, ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected Jan. 29, 1894, by E. W. Nelson and E. A. Goldman. Orig. No. 5787.

Characters.—Size medium; ears large and nearly naked; tail long and nearly naked; coloration dark. Skull with broadly spreading zygomata. Similar to *P. mexicanus*, but differing in slightly larger size, decidedly longer tail and hind feet, slightly more white on hind feet, and decidedly more spreading zygomata.

Color.—Upper parts: top of head and back dusky seal-brown from intimate mixture of black and chestnut, the black predominating and shading into dull chestnut-fulvous on sides and cheeks; top and sides of nose and ring round eye dusky; underparts, including lips, wrists, and fore feet, white; ankles dusky; hind feet whitish, clouded basally with dusky; a pale salmon suffusion on pectoral region, sometimes extending over breast; tail dusky above, irregularly whitish or yellowish below.

Cranial characters.—Skull like that of *mexicanus*, but zygomata decidedly stronger, more squarely and widely spreading anteriorly, and more deeply notched by anteorbital slits; the vertical lamina on outer side of slit much more prominent.

Measurements.—Type specimen: Total length 257; tail vertebræ 139;

hind foot 29.5. Average of 10 specimens from type locality: Total length 258; tail vertebræ 138; hind foot 29.

Peromyscus tehuantepecus sp. nov.

Type from Tehuantepec, Oaxaca, Mexico. No. 75302, ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected May 23, 1895, by E. W. Nelson and E. A. Goldman. Orig. No. 7980.

Characters.—Size medium; ears medium and nearly naked; tail medium, scantily haired; color brownish or buffy-fulvous. Similar to P. *mexicanus*, but very much paler and with distinctive cranial characters.

Color.—Upper parts pale brownish-fulvous, slightly darkened on back by admixture of black hairs, becoming pure buffy-fulvous on cheeks and sides; under parts and lips whitish, often tinged with yellowish or buffy and with a buffy-salmon suffusion on pectoral region; ankles dusky in front, the dusky reaching out a short distance on metatarsus; fore and hind feet whitish; tail dusky, its under side irregularly marked with yellowish.

Cranial characters.—Skull similar to that of *mexicanus*, but braincase and zygomata narrower; rostrum larger; *interparietal decidedly larger.*

Measurements.—Type specimen: Total length 243; tail vertebræ 124; hind foot 26. Average of 4 specimens from type locality: Total length 248.5; tail vertebræ 127; hind foot 27.

Peromyscus oaxacensis sp. nov.

Type from Cerro San Felipe, Oaxaca, Mexico (alt. 10,000 ft.). No. 68426, ♂ yg. ad. U. S. Nat. Mus., Biological Survey Coll. Collected Sept. 1, 1894, by E. W. Nelson and E. A. Goldman. Orig. No. 6700.

Characters.—Size medium, about equalling *P. mexicanus;* ears medium and nearly naked; tail long and scant haired but decidedly more hairy than in *mexicanus* and its subspecies, from which it differs further in being sharply bicolor.

Color.—Upperparts from nose to tail dull fulvous, darkened on back by admixture of black hairs; a very narrow dusky ring round eye; underparts, lips, and fore feet white; ankles dusky; hind feet white except at extreme base, where dusky of ankles reaches down a short distance; tail dusky above, white below. Specimens from Mts. 15 miles west of Oaxaca show two pelages, one considerably darker than that here described.

Cranial and dental characters.—Skull similar to that of *mexicanus*, but postpalatal notch much broader; audital bullæ larger; m^1 narrower and less bellied on inner side behind anterior cusp; m_1 with a supplementary narrow enamel loop on outer side in front of posterior cusp.

Measurements.—Type specimen: Total length 242; tail vertebræ 122; hind foot 27.

Peromyscus felipensis sp. nov.

Type from Cerro San Felipe, Oaxaca, Mexico (alt. 10,200 ft.). No. 68409, ♂ ad. U. S. Nat. Mus., Biological Survey Coll. Collected Aug. 22, 1894, by E. W. Nelson and E. A. Goldman. Orig. No. 6611.

Characters.—Similar to *P. difficilis* Allen, but slightly larger and very much darker, with slightly smaller ears and much coarser pelage. Ears large and appearing naked; tail long and well haired; bicolor.

Color.—Upper parts dusky grayish; under parts, lips, and sides of nose white, the plumbeous basal fur showing through; pectoral region usually salmon; ring round eye dusky; ankles dusky; fore and hind feet white; tail bicolor, dusky above, whitish below.

Cranial characters.—Skull rather large; braincase well rounded; audital bullæ large and inflated. Compared with *P. difficilis* the skull is slightly larger and the rostrum slightly heavier.

Measurements.—Type specimen: Total length 238; tail vertebræ 125; hind foot 27.5. Average of 10 specimens from type locality: Total length 241.5; tail vertebræ 127; hind foot 26.8.

Peromyscus gratus sp. nov.

Type from Tlalpam, Valley of Mexico. No. 50619, ♀, U. S. Nat. Mus., Biological Survey Coll. Collected Nov. 30, 1892, by E. W. Nelson. Orig. No. 3927.

Characters.—Size small; ears large; tail a little longer than head and body and well haired; color pale fulvous. Similar to *P. truei*, but more highly colored; ears shorter and tail longer.

Color.—Upper parts pale buffy-fulvous, everywhere darkened by admixture of black hairs; under parts milk-white; ankles dusky all round except along outer side of calcaneum, which is white; fore and hind feet white; tail dusky, indistinctly paler on under side.

Cranial characters.—Skull small; braincase very globular and smoothly rounded; frontals rather broad interorbitally, but without trace of supraorbital bead; rostrum small; zygomata rather weak but strongly notched by anteorbital slit; audital bullæ very large and inflated. The skull resembles that of *truei*, but is smaller, with decidedly smaller rostrum and shorter palate.

Measurements.—Type specimen: Total length 209; tail vertebræ 114; hind foot 23. Average of 10 specimens from type locality: Total length 204; tail vertebræ 110.5; hind foot 22.8.

Peromyscus levipes sp. nov.

Type from Mt. Malinche, Tlaxcala, Mexico (alt. 8400 ft.). No. 53673, ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected May 12, 1893, by E. W. Nelson. Orig. No. 4799.

Characters.—Size medium or rather small; ears rather large; tail slightly longer than head and body, well haired and bicolor. Similar to *P. gratus*, but color duller, tail sharply bicolor instead of only faintly paler below, and skull different.

Color.—Upper parts grayish-brown becoming pale buffy-fulvous on cheeks and lower sides; under parts and lips white with a salmon suffusion on pectoral region; ankles dusky; fore and hind feet white; tail dusky above, whitish below.

Cranial characters.—Skull resembling that of *P. gratus*, but larger, braincase flatter; zygomata more spreading and less notched by anteorbital slit; rostrum heavier as seen from below; audital bullæ smaller; nasals longer.

Measurements.—Type specimen: Total length 200; tail vertebræ 102; hind foot 23.5.

Peromyscus hylocetes sp. nov.

Type from Patzcuaro, Michoacan, Mexico (alt. about 8000 ft.). No. 50423, ♀ ad., U. S. Nat. Mus., Biological Survey Coll. Collected July 27, 1892, by E. W. Nelson and E. A. Goldman. Orig. No. 2961.

Characters.—Size medium; ears medium; tail shorter than head and body well haired and sharply bicolor. Color grayish.

Color.—Upperparts buffy gray becoming buffy ochraceous on sides and with a broad dark dorsal area resulting from bountiful admixture of black hairs; underparts, lips, and fore feet whitish; wrists and ankles dusky, the color of latter spreading over basal part of hind foot; tail dusky above, white below.

Cranial characters.—Skull rather broad and short, with moderately spreading zygomata and no supraorbital beads: braincase rather full and broadly rounded; audital bullæ smaller than in the *truei-difficilis* group, but larger than in *mexicanus* and slightly larger than *oaxacensis*.

Measurements.—Type specimen: Total length 238; tail vertebræ 114; hind foot 25. Average of 3 specimens from type locality: Total length 232; tail vertebræ 112; hind foot 26

Peromyscus musculoides sp. nov.

Type from Cuicatlan, Oaxaca, Mexico (alt. 1800 ft.). No. 69661, ♂ old, U. S. Nat. Mus., Biological Survey Coll. Collected Oct. 14, 1894, by E. W. Nelson and E. A. Goldman. Orig. No. 6892.

Characters.—Size a little larger than *Mus musculus*, which it greatly resembles; pelage short, close and rather coarse; ears rather short; tail shorter than head and body, moderately haired, bicolor.

Color.—Upperparts drab gray, becoming brownish on sides; underparts, lips and sides of nose milk-white; ankles dusky; fore and hind feet white; tail brownish above, whitish below.

Cranial characters.—Skull small; braincase rounded; frontals broad between orbits but without trace of 'bead'; zygomata strongly notched by anteorbital slits; audital bullæ small.

Measurements.—Type specimen: Total length 187; tail vertebræ 88; hind foot 22.5. Average of 10 specimens from type locality: Total length 185; tail vertebræ 84.5; hind foot 22.5.

Peromyscus mekisturus sp. nov.

Type from Chalchicomula, Puebla, Mexico (alt. 8400 ft.). No. 64108, ♀ ad., U. S. Nat. Mus., Biological Survey Coll. Collected March 16, 1894, by E. W. Nelson and E. A. Goldman. Orig. No. 5951.

Characters.—Size small; ears large; tail enormously elongated and moderately haired; fur long and soft; color grayish-fulvous.

Color.—Upper parts gray anteriorly, becoming more and more suffused with olivaceous-fulvous to the rump, which is pale fulvous; back slightly darkened by black hairs, but no dark dorsal area; nose gray, with a small whitish fleck on extreme tip; ring round eye dusky; under parts buffy-whitish, becoming buffy on pectoral region and whitish on chin, lips, and sides of nose; wrists dusky; fore feet white; front of ankles and upper two-thirds of metatarsus dusky; rest of hind feet, toes, and sides of ankles white; tail dusky, indistinctly paler below.

Cranial characters.—Skull small; rostrum short and narrow; zygomata squarely but narrowly spreading anteriorly, the outer sides strongly convergent anteriorly; frontals narrow interorbitally without trace of supraorbital bead; braincase broad and rather flat; interparietal narrow; audital bullæ small.

Measurements.—Type specimen: Total length 249; tail vertebræ 155; hind foot 24.

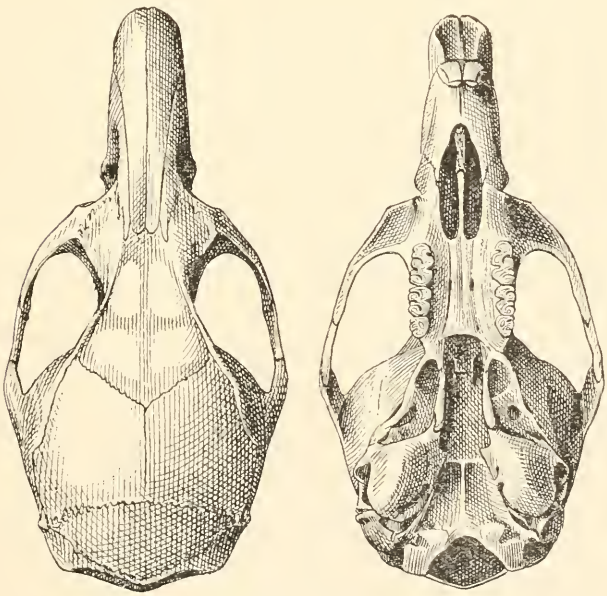

Fig. 20.—Skull of *Megadontomys thomasi* (× 1½).

See page 115.

VOL. XII, PP. 127-129 APRIL 30, 1898

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW GENUS (*NEOTOMODON*) AND THREE NEW SPECIES OF MURINE RODENTS FROM THE MOUNTAINS OF SOUTHERN MEXICO.

BY C. HART MERRIAM.

Still another genus—and one strikingly different from any heretofore described—is represented by 57 specimens in Mr. E. W. Nelson's rich collections from southern Mexico. The animals were found living among dense grass at high elevations on Mt. Orizaba, Puebla; the Cofre de Perote, Vera Cruz; the mountains at Nahuatzin, Michoacan; and on Mt. Popocatapetl, Mt. Toluca, and others about the valley of Mexico. Those from Mt. Orizaba and the Cofre de Perote are distinct species; all the others may be classed together as a third species.

Genus NEOTOMODON nobis.

Type, *Neotomodon alstoni* sp. nov., from Nahuatzin, Michoacan, Mexico.

Characters.—Size of a large *Microtus;* ears large and nearly naked; tail medium or rather short; fur soft and dense; plantar tubercles 6; mammæ 6; pectoral $\frac{4}{4}$; inguinal $\frac{2}{2}$; general appearance intermediate between *Microtus* and *Peromyscus* of the *guatemalensis* group. Skull and teeth unique; skull broad and rather high; braincase short and rounded [in *N. alstoni* angular and truncate posteriorly in old age]; zygomata large and broadly spreading, the anterior root deeply notched by anteorbital slit, the outer lamina of which is produced far forward; incisive foramina very long and open; diastema $\frac{1}{3}$ the basal length of skull. Molars rooted, large, and very massive, with flat crowns and heavy enamel as in *Neotoma;* enamel loops open throughout; m^1 and m^2 essentially alike, each with 3 salient enamel loops and 2 deep reëntrant angles on outer side and 2 salient loops and 1 shallow reëntrant angle on inner side, as in *Neotoma desertorum*, from which the teeth differ in having the loops more nearly

transverse and the two ends of each crown more alike; m^3 a cylindrical peg; enamel pattern of lower molars in general like that of *Hodomys*, with differences in detail: m_1 and m_2 with 3 salient loops and 2 reëntrant angles on each side, the middle loops of the two sides not opposite; m_2 with anterior loop on outer side narrow and followed by a shallow reëntrant angle; m_3 shaped much like letter S: outer side with 2 prominent and strongly convex loops and 1 deep reëntrant angle; inner side with a convex anterior loop, a moderately deep reëntrant angle, and a long flat heel which curves outward posteriorly to form posterior loop on outer side.

The enamel pattern of the crowns of the middle upper and 1st and 2d lower molars changes rapidly with wear; that of the last lower molar more slowly; in m^2 the anterior reëntrant angle on outer side disappears, leaving a large anterior and small posterior lobe, with a small enamel island in the former; in m_1 and m_2 the anterior reëntrant angle on outer side and posterior reëntrant angle on inner side disappear, converting the crown into two large lobes not unlike a figure 8 turned sideways; in m_3 the resulting shape is more like the letter S; in m_3 the reëntrant angle on inner side disappears with age, leaving the inner side plain. The upper molars seem too large for the jaw, and the middle ones are sometimes tilted out of line.

Neotomodon alstoni sp. nov.

Type from Nahuatzin, Michoacan, Mexico (alt. 8500 ft.). No. 50534, ♂ old, U. S. Nat. Mus., Biological Survey Coll. Collected Oct. 12, 1892, by E. W. Nelson. Orig. No. 3580.

Characters.—Size of a rather large *Microtus pennsylvanicus;* ears large and scantily haired; hind feet rather long and slender; tail shorter than head and body, sharply bicolor, and moderately haired; color dusky grayish. *N. alstoni* is the largest of the three species here described.

Color.—Upper parts dusky grayish, darkened on back, and varying with season to dull fulvous brown; under parts dark plumbeous, washed with white and with a rather faint buffy suffusion on pectoral region; wrists and ankles dusky, the dusky extending out a short distance on metatarsus; fore and hind feet white; tail bicolor, dusky above, whitish below.

Cranial characters.—The cranial and dental characters have been fully described under the genus and need not be repeated. Compared with the other known species of the genus, *perotensis* and *orizabæ*, the skull is larger and heavier, and when old much more angular.

Measurements.—Type specimen (♂ old): Total length 225; tail vertebræ 103; hind foot 28. Average of 7 specimens from type locality: Total length 220; tail vertebræ 101; hind foot 26.5.

Remarks.—Specimens referred to this species were collected by Mr. Nelson at Nahuatzin, Michoacan, Huitzilac, Morelos, and the following places in the State of Mexico: Amecameca, Ajusco, north slope of Volcan Toluca, Toluca Valley, Salazar, and Mt. Popocatapetl.

Neotomodon perotensis sp. nov.

Type from Cofre de Perote, Vera Cruz, Mexico (alt. 9500 ft.). No. 54398, ♀ ad., U. S. Nat. Mus., Biological Survey Coll. Collected May 29, 1893, by E. W. Nelson. Orig. No. 4897.

Characters.—Similar to *N. alstoni*, but ears and tail shorter; color paler, with a distinct blackish dorsal stripe in summer pelage.

Color.— Upper parts in fresh summer pelage (end of May) grayish buff, grayest on head, buffy on sides, with a distinct (but not sharply limited) blackish band on back; under parts white, suffused with buffy on pectoral region, and with the plumbeous basal fur slightly showing through; wrists and ankles dusky; fore and hind feet white; tail sharply bicolor, dusky above, white below. Specimens in left-over winter pelage are much darker and resemble *N. alstoni*.

Cranial characters.—Skull similar to that of *N. alstoni*, but slightly smaller, and in old age not becoming so angular.

Measurements.—Type specimen: Total length 212; tail vertebræ 91; hind foot 24. Average of 4 specimens from type locality: Total length 213; tail vertebræ 92.5; hind foot 25.

Neotomodon orizabæ sp. nov.

Type from Mt. Orizaba, Puebla, Mexico (alt. 9500 ft.). No. 53486, ♂ old, U. S. Nat. Mus., Biological Survey Coll. Collected April 26, 1893, by E. W. Nelson. Orig. No. 4747.

Characters.—Similar to *N. alstoni* and *perotensis*, but much smaller and grayer, with slightly smaller ears and decidedly shorter tail. Resembles a gray *Microtus*.

Color.—Upper parts uniform buffy-gray; under parts white, suffused with buffy on pectoral region, with plumbeous basal fur showing through; wrists and ankles dusky; fore and hind feet whitish; tail sharply bicolor, brownish above, white below.

Cranial characters.—Skull like that of *perotensis*, but smaller and weaker.

Measurements.—Type specimen: Total length 194; tail vertebræ 81; hind foot 24. Average of 4 specimens from type locality: Total length 194; tail vertebræ 82; hind foot 25.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

ON SOME BIRDS FROM SANTA MARTA, COLOMBIA

BY OUTRAM BANGS

Mr. W. W. Brown, Jr., who is collecting in the Santa Marta region of Colombia for the Bangs Collection, sent a short time ago nearly seven hundred beautifully made bird skins as the result of his first two months' work—from middle of Dec., 1897, to middle of Feb., 1898. These birds were all taken within fifteen miles of Santa Marta and at elevations ranging from 500 to nearly 6000 feet, the larger part, however, being from the lowlands. Mr. Brown has not yet visited any of the higher mountains. I have thought it best to publish briefly on the collections as they come in, describing the forms which appear to be new and giving mere lists of the better known species. These preliminary notices may be followed by a more elaborate paper when the whole region of the Santa Marta Mountains has been covered.

I am much indebted to the unfailing kindness of Mr. Robert Ridgway and Dr. Chas. W. Richmond in helping me identify the birds and allowing me to work in the National Museum and make comparisons with the material in that collection.

A series of the birds has been presented to the United States National Museum; the rest of the collection, including the types of the new forms, remain in the Bangs collection.

(Note.—All measurements are in millimeters.)

Crypturus columbianus Salvad.

1 specimen. At the time the British Museum Catalogue appeared this bird was known by the type specimen alone. The one example so far sent agrees exactly with the description of the species.

Crypturus pileatus Bodd.

1 specimen, ♀ ad. This one specimen is very different from the general run of *C. pileatus*, and probably represents a good race, at least. It is much deeper in color. The lower parts are a deep rich cinnamon without grayer pectoral band.

Crax alberti Fraser.

1 specimen, ♂ ad.

Penelope argyrotis (Bonap.)

1 specimen, ♂ ad.

Leptotila verreauxi Bonap.

2 specimens, ♂ ♂.

Columbigallina passerina pallescens (Baird).

1 specimen, ♂.

Columbigallina rufipennis (Bonap.)

3 specimens, ♂ ♂, ♀.

Buteo latissimus (Wils.)

3 specimens, ♂ and ♀ ad., ♀ yg., winter residents.

Rupornis magnirostris (Gmel.)

1 specimen, ♀ ad.

Micrastur semitorquatus (Vieill.)?

1 specimen, ♂.

Syrnium perspicillatum (Latham).

1 specimen, ♂.

Ara chloroptera Gray.

1 specimen, ♀.

Ara militaris (Linn.)

2 specimens, ♂, ♀.

Brotogeris jugularis (Müll.)

16 specimens, ♂ ♂, ♀ ♀.

Pionus menstruus (Linn.)

2 specimens, ♂, ♀.

Pionus sordidus (Linn.)

2 specimens, ♂, ♀. At an altitude of 5000 ft. Mr. Brown took, Feb. 12 and 13, 1898, a pair of this rare parrot, known before only from Venezuela. These birds agree exactly in measurements, color of bill and general coloration with the descriptions of *P. sordidus*. An actual comparison of specimens, however, might well show the Santa Marta examples to represent a different race.

Crotophaga sulcirostris Sw.

2 specimens, ♂ ♂.

Piaya cayana mehleri (Bonap.)

7 specimens, ♂ ♂, ♀ ♀.

Momotus subrufescens Scl.

23 specimens, ♂ ♂, ♀ ♀. Topotypes.

Ceryle torquata (Linn.)

2 specimens, ♀ ♀.

Ceryle amazona (Lath.)

1 specimen, ♀.

Ceryle americana (Gmel.)

2 specimens, ♀ ♀.

Bucco ruficollis (Wagl.)

8 specimens, ♂ ♂, ♀ ♀.

Malacoptila mystacalis (Lafr.)

2 specimens, ♂, ♀.

Galbula ruficauda pallens subsp. nov.

17 specimens, ♂ ♂, ♀ ♀.

Type from Santa Marta, Colombia, No. 5073, coll. of E. A. and O. Bangs. ♂ adult. Collected Dec. 27, 1897, by W. W. Brown, Jr.

Subspecific characters.—Size of true *G. ruficauda;* bill longer; sexes very different, the female being much paler below than the male; colors above about as in true *G. ruficauda;* below, in ♂, throat white, slightly washed with pale orange rufous; belly and sides, back of green pectoral band, orange rufous; in ♀, throat white, extensively washed with orange buff; belly and sides, back of green pectoral band, orange buff.

Size.—♂, wing, 85.6; tail, 122; exposed culmen, 56. ♀, wing, 84; tail, 111; exposed culmen, 58.

Remarks.—There is but a very slight individual variation in size, length

of bill, and color in this series, and the long bill, great sexual difference in color, and paler under parts in both sexes distinguish the birds of the Santa Marta region as a good subspecies of *G. ruficauda*.

Ramphastos brevicarinatus Gould.

4 specimens, ♂ ♂, ♀ ♀.

Pteroglossus torquatus (Gmel.)

11 specimens, ♂ ♂, ♀ ♀.

Aulacorhamphus calorhynchus Gould.

1 specimen, ♀. Topotype.

Campephilus malherbii Gray.

6 specimens, ♂ ♂, ♀ ♀.

Ceophlœus lineatus (Linn.)

2 specimens, ♂ ♂.

Melanerpes wagleri sanctæ-martæ subsp. nov.

11 specimens, ♂ ♂, ♀ ♀.

Type from Santa Marta, Colombia, No. 5103, coll. of E. A. and O. Bangs. ♂ ad. Collected Feb. 8, 1898, by W. W. Brown, Jr.

Subspecific characters.—Similar to *M. wagleri* of Panama, but much smaller; much more white on inner tail feathers, the inner webs being white to the quill, with three or four small black spots and black tips; much larger than *M. neglectus*, with much longer bill.

Size.—♂, wing, 107.6; tail, 51.6; exposed culmen, 24. ♀, wing, 104; tail, 49.4; exposed culmen, 22.2.

Remarks.—*M. wagleri* of Panama seems to be specifically distinct from *M. subelegans* of Venezuela, the former having the crown patch continuous red from crown to nape, while in the latter the crown patch is broken by brownish between crown and nape. Unfortunately there are no males of *M. neglectus* in the National Museum collection, but this bird is so much smaller than *M. sanctæ-martæ* and has such a very short bill as to be at once distinguished from it. *M. sanctæ-martæ* is a small race of *M. wagleri*, with much more white on the inner pair of tail feathers, the black markings being usually spots, not bars.

Glaucis hirsuta (Gould.)

2 specimens, ♂, ♀.

Phœthornis longirostris (Less. and De Lat.)

1 specimen, ♂.

Phœthornis anthophilus (Bourc. and Muls.)

5 specimens, ♂ ♂, ♀ ♀.

Lampornis violicauda (Bodd.)

3 specimens, ♀ ♀.

Hypuroptila buffoni (Less.)

11 specimens, ♂ ♂, ♀ ♀.

Florisuga mellivora (Linn.)

16 specimens, ♂ ♂, ♀ ♀.

Petasophora delphinæ (Less.)

1 specimen, ♂.

Floricola longirostris (Vieill.)

1 specimen, ♂; altitude 6000 ft.

Thalurania columbica (Bourc.)

12 specimens; 9, ♂ ♂; 3, ♀ ♀.

Amazilia fuscicaudata (Fraser).

9 specimens, ♂ ♂, ♀ ♀.

Amazilia warszewezi (Cab. and Heine.)

43 specimens, ♂ ♂, ♀ ♀.

Hylocharis cyanea (Vieill.)

12 specimens, ♂ ♂, ♀ ♀. This hummer, so far as I know, has not before been taken in this region.

Nyctidromus albicollis (Gmel.)

3 specimens, ♂ ♂.

Sayornis cineracea (Lafr.)

2 specimens, ♂ and ♀.

Todirostrum nigriceps Scl.

1 specimen, ♀.

Todirostrum schistaceiceps Scl.

1 specimen, ♂.

Euscarthmus impiger Scl. & Salv.

2 specimens, ♂ ♂.

Colopterus pilaris Cab.

2 specimens, ♀ ♀.

Mionectes oleagineus (Licht.)

4 specimens, ♂ ♂, ♀ ♀.

Myiopatis semifuscus (Scl.)

6 specimens, ♂ ♂, ♀ ♀. Topotypes. The specimen from La Guayra, Venez., recorded in Lieut. Robinson's paper, Proc. U. S. Nat. Mus., XVIII, p. 684, as a *Pogonotriccus*, is an example of this species in immature plumage.

Ornithion pusillum (Cab. & Heine.)

1 specimen, ♀.

Tyranniscus griseiceps Scl. & Salv.

1 specimen, ♂.

Elainea pagana (Licht.)

6 specimens, ♂ ♂, ♀ ♀.

Myiopagis placens (Scl.)

3 specimens, ♂ ♂, ♀.

Myiopagis macilvainii (Lawr.)

2 specimens, ♂ and ♀.

Sublegatus glaber Scl. & Salv.

1 specimen, ♂. Wing (2.90 inches), 73.66 mm., corresponding with *S. glaber* and not with the form called *S. platyrhynchus* of which Sclater records a specimen from Santa Marta, Cat. Bds. Brit. Mus., XIV, p. 159.

Myiozetetes texensis colombianus (Cab. and Heine.)

1 specimen, ♀.

Rhynchocyclus sulphurescens (Spix.)

1 specimen, ♂.

Rhynchocyclus flaviventris (Max.)

10 specimens, ♂ ♂, ♀ ♀.

Pitangus derbianus rufipennis (Lafr.)

2 specimens, ♂ ♂.

Myiodynastes audax nobilis (Scl.)

3 specimens, ♂ ♂, ♀.

Megarhynchus pitangua (Linn.)

9 specimens, ♂ ♂, ♀ ♀.

Muscivora mexicana Scl.

3 specimens, ♂ ♂, ♀.

Empidonax virescens (Vieill.)

1 specimen, ♂. Winter resident.

Contopus brachytarsus (Scl.)

1 specimen, ♀.

Myiarchus crinitus (Linn.)

1 specimen, ♀. Winter resident.

Myiarchus erythrocercus Scl. & Salv.

26 specimens, ♂ ♂, ♀ ♀.

Myiarchus ferox (Gmel.)

5 specimens ♂ ♂, ♀ ♀.

Myiarchus nigriceps Scl.

3 specimens, ♂, ♀ ♀.

Tyrannus melancholicus satrapa (Licht.)

7 specimens, ♂ ♂, ♀ ♀.

Milvulus tyrannus (Linn.)

1 specimen, ♂.

Pipra auricapilla Licht.

5 specimens, ♂ ♂, ♀ ♀.

Chiroxiphia lanceolata Wagl.

20 specimens, ♂ ♂, ♀ ♀ and young.

Manacus manacus (Linn.)

8 specimens, ♂ ♂.

Thamnophilus melanonotus Scl.

9 specimens, ♂ ♂, ♀ ♀. Topotypes.

Thamnophilus nævius (Gmel.)

2 specimens, ♂ ♂.

Eriodora intermedia Cab.

3 specimens, ♂ ♂.

Myrmeciza boucardi Berl.

2 specimens, ♂ ♂.

Rhamphocænus rufiventris sanctæ-marthæ Scl.

1 specimen, ♂ ad. Topotype.

Dendroplex picirostris (Lafr.)

4 specimens, ♂ ♂, ♀ ♀.

Dendrocincla olivacea anguina subsp. nov.

1 specimen.

Type from Santa Marta, Colombia, No. 5327, ♂ adult, coll. of E. A. and O. Bangs. Collected Feb. 15, 1898, by W. W. Brown, Jr. Altitude, 5000 ft.

Subspecific characters.—As compared with specimens of true *D. olivacea* from Panama, bill much smaller; wing a trifle longer; tail longer; colors above more olivaceous; wings darker, more olive, less rufous.

Size.—♂, wing, 106.4; tail, 87.2; exposed culmen, 24.

Remarks.—In birds from Nicaragua the bill is still larger than in true *D. olivacea* and the wing considerably shorter. They appear to represent another good subspecies.

Furnarius agnatus Scl. & Salv.

1 specimen, ♂.

Xenops genibarbis Ill.

1 specimen.

Cyanocorax affinis Pelzeln.

9 specimens, ♂ ♂, ♀ ♀.

Cassicus persicus (Linn.)

5 specimens, ♂ ♂, ♀ ♀.

Icterus xanthornus (Linn.)

11 specimens, ♂ ♂, ♀ ♀.

Icterus auricapillus Cassin.

9 specimens, ♂ ♂, ♀ ♀.

Icterus galbula (Linn.)

1 specimen, ♂. Winter resident.

Chrysomitris mexicana (Sw.)

1 specimen, ♂ adult. Perfectly typical of this form.

Chrysomitris columbiana (Lafr.)

1 specimen, ♂ adult. Perfectly typical of this form.

Volatinia jacarini splendens (Vieill.)

2 specimens, ♂ and ♀.

Sycalis browni sp. nov.

2 specimens, ♂ and ♀ young.

Type from Santa Marta, Colombia, No. 5359, ♂ adult, coll. of E. A. and O. Bangs. Collected Feb. 2, 1898, by W. W. Brown, Jr. Altitude 5000 ft.

Specific characters.—♂ adult, size very small; bill slender and small; much white on two outer pairs of tail feathers; wings dusky, edged with greenish yellow; tail dusky, outer feather with the inner web white for its terminal half, second feather with the inner web white for its terminal third; nape and interscapulum dull olive green with dusky markings on shafts of feathers; crown patch shining chrome yellow; rump and upper tail-coverts wax yellow; under parts, from chin to under tail coverts, dull gamboge yellow, slightly more olivaceous on flanks.

Size.—♂ adult, wing, 66.4; tail, 44; exposed culmen, 7.8.

Remarks.—Mr. Brown took at an altitude of 5000 ft. the type of this species, and at 3000 ft., Feb. 19, 1898, a young female in nestling plumage. This new *Sycalis*, which I have named for Mr. Brown, is not closely related to any known species, its very small delicate bill, small size, the great amount of white in its tail feathers, and its peculiar coloring distinguishing it from all others.

Cyanocompsa concreta sanctæ-martæ subsp. nov.

5 specimens, ♂ ♂, ♀.

Type from Santa Marta, Colombia, No. 5361, ♂ adult, coll. of E. A. and O. Bangs. Collected Feb. 2, 1898, by W. W. Brown, Jr. Altitude 3000 feet.

Subspecific characters.—Similar to *C. concreta cyanescens*, but adult male still more decidedly blue, the general color dull grayish blue (interme-

diate between indigo blue and dull china blue). *Adult female* similar to that of *C. concreta cyanescens*, but duller brown (upper parts nearer bistre than vandyke brown, under parts between light bistre and raw umber).

Size.—♂ adult, length (skins), 143–149.5; wing, 77–82.5; tail, 64.5–68.5; exposed culmen, 17.5–18.5; depth of bill at base, 15.5–16.5; width of mandible at base, 13; tarsus, 20–21; middle toe, 13–15.* ♀ adult, length (skin), 147; wing, 79; tail, 64; exposed culmen, 18.5; depth of bill at base, 16.5; width of mandible at base, 13; tarsus, 20.5; middle toe, 14.†

Remarks.—Mr. Brown obtained five specimens of this form at altitudes of 1800 to 5000 feet.

Zamelodia ludoviciana (Linn.)

5 specimens, ♂ ♂, ♀ ♀. Winter resident.

Spiza americana (Gmel.)

5 specimens, ♂ ♂, ♀ ♀. Winter resident.

Arremonops conirostris canens subsp. nov.

3 specimens, ♂, ♀ ♀.

Type from Santa Marta, Colombia, No. 5371, ♂ adult, coll. of E. A. and O. Bangs. Collected Jan. 15, 1898, by W. W. Brown, Jr.

Subspecific characters.—Smaller than *A. conirostris*; wings and tail darker, more dusky, less greenish; back much grayer, the feathers tipped and edged with gray; nape and head between the black stripes clear gray without any olive or greenish.

Size.—♂ adult, wing, 76.2; tail, 64.6; exposed culmen, 14; ♀ adult, wing, 66; tail, 57; exposed culmen, 14.

Remarks.—*A. conirostris canens* differs so much in color from true *A. conirostris* besides being considerably smaller, that it may prove to be a distinct species, though for the present I prefer to treat it as a subspecies.

Saltator magnus (Gmel.)

1 specimen, adult ♂. This one example is not at all typical, and if others from the same region are found to agree with it, the form deserves separation as a subspecies.

Saltator striatipectus Lafr.

1 specimen, ♂ adult.

Arremon schlegeli Bp.

5 specimens, ♂ ♂, ♀ ♀.

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* Four specimens.

† One specimen.

Emberizoides macrurus (Gmel.)

1 specimen, ♂. The type locality of *E. macrurus* is Cayenne. The one Santa Marta specimen differs from birds from that region in having yellow instead of white throat, being richer in color throughout and in having a shorter wing. Should other specimens bear out these characters, then the Santa Marta bird must be separated as a subspecies.

Euphonia trinitatis Strick.

1 specimen, ♂.

Euphonia crassirostris Scl.

27 specimens, ♂ ♂, ♀ ♀ and young.

Calospiza desmaresti (Gray).

5 specimens, ♂ ♂.

Calospiza sp.?

1 specimen, ♀. I have been unable to identify this skin. The bird has a very large, thick bill and may represent a new species. A good male specimen is necessary, however, before this can be settled.

Tanagra cana Sw.

23 specimens, ♂ ♂, ♀ ♀.

Tanagra palmarum melanoptera (Hartl.)

1 specimen, ♂.

Ramphocelus dimidiatus Lafr.

25 specimens, ♂ ♂, ♀ ♀ and young ♂ ♂.

Piranga rubra (Linn.)

7 specimens, ♂ ♂, ♀ ♀. Winter resident.

Piranga faceta sp. nov.

2 specimens, ♂ adult, ♀ adult.

Type from Santa Marta, Colombia, No. 5452, ♂ adult, coll. of E. A. and O. Bangs. Collected Feb. 4, 1898, by W. W. Brown, Jr. Altitude 3000 ft.

Specific characters.—♂, size rather small (about the size of *P. hæmalea*); tail long; bill very small, much smaller than that of *P. hæmalea* or *P. testacea*, and not so swollen; tooth on edge of upper mandible very prominent; upper parts deep brownish red, more intense (shading towards dark carmin) on head; wings dusky, the feathers edged with dark red, without wing bars; under parts bright orange vermilion, browner on flanks and more scarlet on throat; ♀ slightly smaller than the ♂; colors

above deep olive green, sides of forehead more yellow; below bright olive yellow, shaded with olive on sides and flanks.

Size.—♂ adult, wing, 89; tail, 76; exposed culmen, 16.6; breadth of bill at nostril, 8.2. ♀ adult, wing, 85.8; tail, 72.6; exposed culmen, 16; breadth of bill at nostril, 8.2.

Remarks.—On Feb. 4, 1898, Mr. Brown took a pair of this beautiful new tanager, the female at 4000 ft. and the male at 3000 ft. *P. facata* scarcely needs comparison with any other form, its bright orange vermilion under parts and small bill at once distinguishing it from *P. testacea* or *P. hæmalea*.

Eucometis cristata (Du Bus.)

6 specimens, ♂ ♂, ♀ ♀.

Stelgidopteryx uropygialis (Lawr.)

6 specimens, ♂ ♂, ♀ ♀.

Cyclarhis flavipectus canticus subsp. nov.

5 specimens, ♂ ♂, ♀ ♀.

Type from Santa Marta, Colombia, No. 5462, ♂ adult, coll. of E. A. and O. Bangs. Collected Jan. 28, 1898, by W. W. Brown, Jr.

Subspecific characters.—Similar to true *C. flavipectus* of Trinidad, but slightly smaller; wing shorter; color of throat and breast much purer, deeper, more golden, less greenish yellow, being in *C. canticus* nearly pure canary yellow.

Size.—♂ adult, wing, 75.2; tail, 58; exposed culmen, 17. ♀ adult, wing, 72.4; tail, 61; exposed culmen, 16.6.

Remarks.—This is the form over which there has been so much discussion. Count Von Berlepsch, Ibis, 1888, p. 85, first noticed the differences, saying "specimens of *C. flavipectus* from Bogota generally show a much purer and deeper golden yellow on the under parts than those from Venezuela and Trinidad." Santa Marta skins seem even more strongly to show these differences than Bogota skins. Dr. J. A. Allen, in Bull. Am. Mus., Vol. II, p. 130, June, 1889, renamed the Trinidad bird, calling it *C. flavipectus trinitatis*. Mr. Frank M. Chapman, when he corrected this mistake in his list of Trinidad birds, Bull. Am. Mus., Vol. VI, p. 27, 1894, referred the Colombia birds to the Costa Rican form *C. subflavescens*, from which they appear to me to be perfectly distinct.

Vireo chivi agilis (Licht.)

8 specimens, ♂ ♂, ♀ ♀.

Hylophilus aurantiifrons Lawr.

4 specimens, ♂ ♂, ♀ ♀.

Hylophilus flavipes Lafr.

5 specimens, ♂ ♂, ♀ ♀.

Dacnis napæa sp. nov.

2 specimens, adult ♂, young ♂, in plumage like that of ♀.

Type from Santa Marta, Colombia, No. 5478, ♂ adult, coll. of E. A. and O. Bangs. Collected Jan. 18, 1898, by W. W. Brown, Jr.

Specific characters.—Adult ♂, about the size of *D. cærebicolor* or rather larger; wing about the same or longer; bill much larger—longer and stouter; color pattern the same; the blue color an intense cobalt blue, very different from the dark purplish blue of *D. cærebicolor;* feet flesh color.

Size.—♂ adult, wing, 69; tail, 47; exposed culmen, 7.6.

Remarks.—*D. napæa* needs comparison with but one species, *D. cærebicolor.* This comparison I have been able to make, the National Museum having a considerable series of Bogota skins. The very large bill and bright blue color of *D. napæa* mark the Santa Marta bird as specifically distinct from the small-billed dark purplish blue *D. cærebicolor* of Bogota.

Arbelorhina cyanea eximia (Caban.)

15 specimens, ♂ ♂, ♀.

Arbelorhina cœrulea microrhyncha Berl.

42 specimens, ♂ ♂, ♀ ♀ and young.

Coereba luteola (Caban.)

6 specimens, ♂ ♂, ♀ ♀.

Mniotilta varia (Linn.)

1 specimen, ♀. Winter resident.

Protonotaria citrea (Bodd.)

21 specimens, ♂ ♂, ♀ ♀. Winter resident.

Helminthophila peregrina (Wils.)

1 specimen, ♂. Winter resident.

Compsothlypis pitiayumi pacifica (Berl.)

2 specimens, ♀ ♀.

Dendroica æstiva (Gmel.)

3 specimens, ♂ ♂, ♀. Winter resident.

Seiurus motacilla (Vieill.)

1 specimen, ♂. Winter resident.

Geothlypis formosa (Wils.)

1 specimen, ♂. Winter resident.

Basileuterus mesochrysus Scl.

5 specimens, ♂ ♂, ♀ ♀.

Basileuterus cabanisi Berl.

1 specimen, adult ♂. This is apparently a rare bird in collections.

Setophaga ruticilla (Linn.)

2 specimens, ♂, ♀. Winter resident.

Thryophilus minlosi Berl.

2 specimens. ♂ ad., ♂ yg.

Polioptila bilineata (Bonap.)

1 specimen, ♀ adult.

Turdus aliciæ Baird.

2 specimens, ♂·♂. Winter resident.

Merula incompta sp. nov.

4 specimens, ♂ ♂, ♀ ♀.

Type from Santa Marta, Colombia, No. 5560, ♀ adult, coll. of E. A. and O. Bangs. Collected Jan. 22, 1898, by W. W. Brown, Jr.

Specific characters.—Size rather small; sexes alike; bill yellow above and below, darker at base; no eye stripe; 4th and 5th primaries nearly equal and longest, 3rd and 6th nearly equal, next, 2nd and 7th equal; legs, feet and claws pale brownish; color above uniform rich olive brown, including lores, ear-coverts, tail and wings, except primaries and inner webs of secondaries, which are more dusky; below, breast and sides olivaceous wood brown; center of belly and under tail-coverts clear buff; throat dull whitish with pale olive brown streaks; under wing-coverts dull orange buff.

Size.—♀ adult, wing, 112.6; tail, 91; exposed culmen, 20. ♂ adult, wing, 114.6; tail, 92.6; exposed culmen, 19.8.

Remarks.—The Santa Marta thrush is most like *M. gymnophthalmus* in general coloration, but can be told from that species by not having the naked eye spots and the under tail-coverts not being streaked. The only other species that it needs to be compared with is *M. ignobilis*, from which its smaller size, yellow bill, and many differences in detail of coloration at once distinguish it.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF NEW SQUIRRELS FROM MEXICO AND CENTRAL AMERICA.

BY E. W. NELSON.

During explorations made in Mexico and parts of Central America for the Biological Survey, U. S. Department of Agriculture, an extraordinarily fine series of squirrels has been secured. The collection contains topotypes of all but two or three of the large number of species described from Mexico, besides specimens from scores of widely scattered localities. After my return from the field a few months ago, Dr. C. Hart Merriam, Chief of the Biological Survey, who had already done some work on the group, generously placed this rich material in my hands for elaboration. In order that I might cover the ground more satisfactorily, Mr. F. W. True, Executive Curator of the U. S. National Museum, placed the entire Museum series of tropical American Squirrels at my disposal, and Dr. J. A. Allen, Curator of Mammals in the American Museum of Natural History, New York, loaned me the series in the collection under his charge. Without the material furnished by Dr. Allen and Mr. True I could not have reached satisfactory conclusions concerning the Central American species, and I wish to express my appreciation of their kindness.

I am also under special obligations to Mr. Oldfield Thomas, Curator of Mammals in the British Museum, for his courtesy in comparing specimens in our collection with type specimens in the British Museum, thus identifying Gray's numerous names with forms from known localities, and furnishing a safe basis for future work.

Revisers of tropical American Squirrels have hitherto worked at great disadvantage, owing to scanty and unsatisfactory material. The collections studied in the present connection contain over six hundred and fifty specimens from Mexico and Central America, besides many from the United States and South America. The large number of topotypes in these collections, together with my personal knowledge of the geographical features of the area covered, have rendered it a comparatively simple matter to disentangle the complications of synonymy that have puzzled former workers. It was a surprise to find that while many of the old names apply to perfectly valid species or subspecies, a considerable number of forms remain to be described. As it will be some time before my revision of the group can be published, it seems advisable to describe the new species and subspecies in this preliminary paper.

Sciurus richmondi sp. nov. Richmond's Squirrel.

Type from Escondido River, Nicaragua. No. $\frac{36481}{18851}$, ♀ ad., U. S. Nat. Mus., Biological Survey Coll. Collected October 4, 1892, by Chas. W. Richmond. Orig. No. 118.

Distribution.—Bluefields and Escondido River region.

Characters.—A small squirrel resembling *S. æstuans*, but back darker brown, lower surface richer, more reddish-fulvous; tail narrow, black, thinly washed with dull fulvous. 1 upper premolar.

Color.—Upper parts from nose to base of tail, including upper surface of fore and hind feet, finely grizzled black and dark fulvous, the fulvous brightest and inclining to rusty on sides of neck and thighs; eyes surrounded by a dull fulvous ring; cheeks dingy grizzled-fulvous, paler than top of head; a small patch of dull fulvous fur behind base of ears. Under parts varying from dingy fulvous to bright reddish-buffy, usually brightest on neck and breast. Anal region and base of tail all round like back; rest of upper surface of tail black, thinly washed with dingy fulvous; under side of tail with a median band of grizzled black and dull rufous, bordered by a blackish band and edged with fulvous.

Measurements.—Type specimen: Total length 384; tail vertebræ 181; hind foot 53.5. Average of 5 adults: Total length 368.6; tail vertebræ 178; hind foot 50.3.

Remarks.—In summer pelage the lower surface is deeper colored than in winter, but there appears to be no other seasonal difference. Individual variation is not marked; the intensity of the fulvous above and below varies from a dingy to a bright reddish-buffy, and there is no trace of whitish or gray on any of the twenty specimens examined. The upper surfaces of the feet are sometimes like the back and sometimes a little brighter fulvous; the ears are scantily covered with short dark hairs.

S. richmondi has a superficial resemblance to *S. deppei*, but is darker and the gray is replaced by fulvous or reddish-buffy.

From *S. æstuans hoffmanni*, to which it is most closely related, it may be readily distinguished by the paler under surface, and especially by the dull fulvous wash, instead of the rich bright rufous on the tail. The general color of dorsal surface is much the same in both, and in intensity of lower surface *richmondi* sometimes approaches closely to *hoffmanni*. The difference between the color edging the tail appears to be constant. So far this species is known only from the lower Escondido River, above Bluefields, Nicaragua, but it undoubtedly has a much wider range. It is probable that when the intermediate country between the known ranges of *S. richmondi* and *S. æstuans hoffmanni* is worked they will be found to intergrade, in which case *S. richmondi* will become a subspecies of *S. æstuans*. This squirrel is named in honor of Dr. Chas. W. Richmond, Assistant Curator of Birds in the U. S. National Museum, who collected the series upon which the description is based.

Sciurus negligens sp. nov. Tampico Squirrel.

Type from Alta Mira, Tamaulipas, Mexico. No. 93028, ♀ ad., U. S. Nat. Mus., Biological Survey Coll. Collected April 18, 1898, by E. A. Goldman. Orig. No. 12319.

Distribution.—State of Tamaulipas, Mexico (from Tampico to Victoria).

Characters.—Size of *S. deppei*, to which it is closely related. Above fulvous-olive-gray; below white, often shading to pale buffy posteriorly. Forelegs and shoulders gray; tail rather full, black, washed with white on upper surface. 1 upper premolar.

Color.—Upper parts from nose to base of tail, including upper surface of hind feet, finely grizzled black and pale olivaceous-fulvous, brightest on flanks and thighs. Sides of head and neck dingy grizzled gray and fulvous; ears slightly rufous; an indistinct ring of pale dull fulvous around eyes. Lower surface white, nearly pure on chin, throat and breast, becoming grayer or shaded with buffy posteriorly. Tops of fore feet, forelegs and shoulders gray; inside of legs paler gray; a gray border sometimes extending from forelegs back along flanks and side of hind legs separating grizzled dorsal area from the paler lower surface. Anal region and base of tail all round like back. Upper surface of tail black, washed with white, the pale yellowish brown basal color showing through; median band on under surface grizzled pale buffy and black, the buffy predominating and bordered by a black band; a thin edging of white around border. Small patch of white and pale buffy fur behind base of ears.

Measurements.—Type specimen: Total length 403; tail vertebræ 195; hind foot 55.

Sciurus alleni sp. nov. Allen's Squirrel.

Type from Monterey, Tamaulipas, Mexico. No. $\frac{25731}{33131}$, ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected Feb. 22, 1891, by C. P. Streator. Orig. No. 563.

Distribution.—Nuevo Leon and Tamaulipas, Mexico.

Characters.—Size and general appearance much like pale specimens of *Sciurus carolinensis fuliginosus;* forelegs and tops of fore and hind feet grayish white; tail bushy, black, washed with white above. 1 upper premolar.

Color.—Entire upper parts, except upper surface of feet and forelegs, finely grizzled with grayish-white, dark fulvous and black; the fulvous darkest on crown and rump, but differing slightly in shade on rest of upper surface. Sides of body and thighs somewhat grayer than back; forelegs to body and fore and hind feet grayish-white, the hairs having black bases and whitish tips; a small indistinct patch of fulvous sometimes present in middle of gray on upper surface of hind foot. Under surface of body pure white. Eyes surrounded by ring of pale fulvous; ears like top of head except for a pale, dingy-fulvous patch behind base in some specimens. Tail moderately bushy, washed with white on upper surface with black and dark fulvous showing through; below a broad median band of dark fulvous grizzled with black and bordered on sides by a narrow band of black; edged externally with white.

Cranial characters.—The skull of this species is most like that of *S. oculatus*, from which it differs in smaller size, slightly stouter rostrum, and larger foramen ovale.

Measurements.—Type specimen: Total length 466; tail vertebræ 220; hind foot 63. Average of five adults: Total length 475; tail vertebræ 223.8; hind foot 62.6.

Remarks.—The little variation in the series before me appears to be purely individual and is produced by the slightly varying intensity of the fulvous. The series examined consists of winter and spring specimens. Its nearest Mexican relative is *S. oculatus*, from which it is perfectly distinct. In size and color it is most like the form of *Sciurus carolinensis*, found in northern and eastern Texas, but the grayish white feet and absence of second premolar serve to distinguish it at once. The absence of the second premolar throws it with *S. arizonensis* and *S. oculatus*, from which its much smaller size, the grizzled blackish-fulvous upper surface, and grayish white feet distinguish it. The lack of a second premolar and darker and much finer grizzled dorsal surface distinguish it sharply from *S. yucatanensis*.

S. alleni is a well-defined species of the Arid Tropical zone and is restricted to a portion of the Tamaulipan faunal district.

I take pleasure in dedicating this species to Dr. J. A. Allen, Curator of Mammals in the American Museum of Natural History, New York.

Sciurus oculatus tolucæ subsp. nov. Toluca Squirrel.

Type from north slope of Volcano of Toluca, Mexico, Mex. No. 55927, ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected Sept. 8, 1893, by E. W. Nelson and E. A. Goldman. Orig. No. 5419.

Distribution.—Pine and fir forests on north slope of Volcano of Toluca, and thence north on adjacent east slope of mountains in State of Mexico

to mountains of central Queretero and Guanajuato, and perhaps reaching the mountains of southwestern San Luis Potosi.

Characters.—A large squirrel, differing from typical *S. oculatus* in not having a black dorsal area and in having tops of feet and entire lower surface whitish or very pale fulvous. 1 upper premolar.

Color.—Similar to *S. oculatus*, but without any definite black area on upper surface and always white or nearly white below. The dorsal surface is darker than the sides, and the fulvous shade, which is barely perceptible on dorsal surface of typical *S. oculatus*, becomes distinct on crown and middle of back. Ear patches uniformly dirty whitish. Tops of feet vary from whitish to pale buffy; ring around eyes dingy whitish with a buffy shade at outer border.

Measurements.—Type specimen: Total length 565; tail vertebræ 266; hind foot 72.

Remarks.—Typical *Sciurus oculatus* Peters, of which *Sciurus melanonotus* Thomas is a synonym, is a common species of the pine forests in the mountains along the eastern border of the Mexican tableland from Mt. Orizaba, Puebla, to eastern San Luis Potosi.

Sciurus goldmani sp. nov. Goldman's Squirrel.

Type from Huehuetan, Chiapas, Mexico. No. 77903, ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected Feb. 28, 1896, by E. W. Nelson and E. A. Goldman. Orig. No. 9435.

Distribution.—Pacific Coast lowlands of Guatemala, ranging north to Huehuetan, Chiapas, Mexico.

Characters.—A large slender species with coarse harsh hair, resembling *S. colliei*. Upper surface dark iron-gray; lower surface white; ears black rimmed, rufous-tufted, with large white patch behind base; tail long, slender, above black washed with white. 2 upper premolars.

Color.—*Winter pelage* (Huehuetan): Upper surface from nose to base of tail, including flanks, outer side of forelegs and thighs, coarsely grizzled black and pale fulvous gray, the fulvous sometimes becoming intensified to a dull orange-buffy. There is usually a thin black wash over dorsal surface, which becomes decidedly heavier on some specimens, with the pale buffy-yellow showing through. Sides of head a little paler than back; ears dingy grayish on inner side and edged with black; a scanty tuft of dark ferruginous hairs on back of ear and a large, conspicuous patch of white behind base; a small but distinct white spot on side of head just below ear. Tops of toes dingy whitish; tops of feet pale iron gray. Upper surface of tail basally like back, rest black thinly washed with white; below grizzled black and gray, dull fulvous or orange-buffy. Under side of body and inside of legs white. Under fur on back dark plumbeous, on ventral surface white or pale plumbeous.

Measurements.—Type specimen: Total length 520; tail vertebræ 264; hind foot 65. Average of 5 adults: Total length 546.8; tail vertebræ 283.8; hind foot 66.6.

Remarks.—In general appearance this species is very similar to *S. collici*, from which it may be distinguished by the distinct black borders and large basal white patches of the ears; the extension of color of back over outside of legs and thighs and the decidedly white upper surface of feet and toes. The under fur is darker on back, with scarcely a trace of lighter tips, and whiter on belly. The back and sides are the same in *goldmani* but for a little heavier wash of black on middle of back. The most intensely colored specimens are as buffy on dorsal surface as the brightest specimens of *S. collici*, but this added shade of buffy is brightest on nape and ears in *collici* and on the rump of *goldmani*. The ears of *collici* are uniform or differ but little in color, while in *goldmani* the varied markings are strong characters.

This species is named in honor of my field assistant, Mr. E. A. Goldman, to whose faithful aid is due much of the success of our explorations in Mexico.

Sciurus boothiæ managuensis subsp. nov. Managua Squirrel.

Type from Managua River, Guatemala. No. 62476, ♂ ad., U. S. Nat. Mus. Coll. Collected Feb. 12, 1895, by Mrs. C. McElroy.

Distribution.—Managua River, eastern Guatemala.

Characters.—Smaller than typical *S. boothiæ*, with coarse, harsh hairs; blackish yellow on dorsal surface, buffy-yellow below. 2 upper premolars.

Color.—Above, including top of head, outside of legs, flanks and base of tail, grizzled black and dingy fulvous, rather grayish; top of head and back washed with black, the subterminal yellowish showing through; legs usually deeper yellowish, in marked contrast; top of feet shading into grizzled buffy. Sides of nose, cheeks, chin, and sometimes throat, dingy grayish with a dull fulvous shade; rest of lower parts bright buffy-yellow. Ears distinctly margined with black, a conspicuous patch of buffy-yellow fur behind base and a thin tuft of rufous hairs near tip. Tail flattened and rather narrow: above, black washed with white; below, grizzled with grayish-fulvous along middle with a band of black along each side, heaviest at tip and bordered externally with white.

Measurements.—Type specimen: Total length 512.5; tail vertebræ 250.5; hind foot 57.

Remarks.—Among the four specimens examined two agree closely in color with the type, the other, apparently immature, is much grayer above and the color of the back extends down on the legs to the feet, the latter being washed with buffy; below it is dingy-buffy.

Sciurus albipes quercinus subsp. nov. Oak Woods Squirrel.

Type from mountains on west side of Valley of Oaxaca, Oaxaca, Mexico. No. 68202, ♀ ad, U. S. Nat. Mus., Biological Survey Coll. Collected Sept. 15, 1894, by E. W. Nelson and E. A. Goldman. Orig. No. 6768.

Distribution.—The pine and oak forests on mountains along western side of Valley of Oaxaca, Oaxaca, Mexico.

Characters.—Size of *S. albipes*, but differs in having the back grizzled yellowish-gray, and the lower surface white or sometimes pale buffy. 2 upper premolars.

Color.—Very similar to *S. albipes nemoralis* from mountains near Patzcuaro, Michoacan, but differing in paler, more yellowish-white dorsal surface; median band on under side of tail commonly buffy or reddish fulvous, bordered with the usual black band edged externally with white. No melanistic phase.

Measurements.—Type specimen: Total length 550; tail vertebræ 285; hind foot 70. Average of five adults: Total length 545.6; tail vertebræ 274.8; hind foot 69.8.

Remarks.—Some specimens are very close to *S. albipes nemoralis* and have the under side of tail nearly as gray as in that form. The feet and under parts are usually white, varying to buffy or fulvous on one out of every 4 or 5 specimens. This is not a strongly defined race, but the characters given are sufficient to distinguish most specimens without difficulty, and in view of its isolation from its nearest related form it appears worthy of recognition.

Sciurus albipes nemoralis subsp. nov. Michoacan Squirrel.

Type from Patzcuaro, Michoacan, Mexico. No. $\frac{35357}{47623}$, ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected July 23, 1892, by E. W. Nelson and E. A. Goldman. Orig. No. 2905.

Distribution.—Sierra Madre, southeast of the Sierra Nevada de Colima, Jalisco, to Volcano of Toluca, State of Mexico (Nahautzin and Patzcuaro, Michoacan and Volcano of Toluca).

Characters.—Size of *S. albipes*, but differs in having back of a clearer iron-gray; lower surface white; under side of tail gray or fulvous-gray. 2 upper premolars.

Color.—Top of nose and crown blackish or dark iron-gray, rest of dorsal surface, including outside of fore and hind legs, grizzled black, gray, or grayish white with an indistinct mixture of dingy fulvous; the fulvous mixture darkest on nape and rump, forming poorly defined patches varying in intensity and sometimes scarcely appreciable; outside of legs and flanks grayer than middle of back; feet white; ears like crown, with conspicuous white patch behind base; eyes surrounded by dull grayish-fulvous ring; cheeks and sides of nose grizzled gray with dingy fulvous shade; lower surface of body white. Base of tail, above like rump, below grizzled gray; rest of upper surface black, heavily washed with white; lower surface with broad median band of grizzled gray or pale fulvous-gray and black, bordered by a band of black and edged externally with white; on some specimens the lower surface of tail is washed with white.

Measurements.—Type specimen: Total length 560; tail vertebræ 295; hind foot 70. Average of 5 adults: Total length 550.6; tail vertebræ 280.6; hind foot 70.

Sciurus albipes colimensis subsp. nov. Colima Squirrel.

Type from the Hacienda Magdalena, Colima, Mexico. No. $\frac{33197}{15202}$, ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected March 19, 1892, by E. W. Nelson and E. A. Goldman. Orig. No. 2239.

Distribution.—Arid tropical forests of Colima, ascending river valleys to Plantinar, Jalisco. Ranging from sea level to 3000 feet.

Characters.—A little smaller, slenderer, and tail narrower than *S. albipes*, from which it differs in having distinct nape and rump patches; rest of back clearer and lighter gray; tops of feet iron-gray; under surface of body white; under surface of tail grizzled iron-gray. 2 upper premolars.

Color.—Upper surface, including tops of fore and hind feet, excepting nape and rump patches, grizzled white or gray and black with a scanty intermixture of rusty or buffy-rufous. Under fur tipped with gray or fulvous according to color on longer hairs. Nose and fore part of crown usually blacker than back; ears similar to nape with patch of dingy white behind base; eyes surrounded with dingy whitish ring; side of nose and cheek to behind eyes gray, sometimes tinged with buffy on cheeks. Tops of feet vary from dark iron-gray to grayish white. Nape and rump patches generally very distinct, and vary from dark rufous to bright rusty-red or dark reddish-buffy, and sometimes dull fulvous. Lower surface of body white. Anal region and base of tail below like middle of back; top of tail at base like rump patch; rest of upper surface of tail black heavily washed with white; below a grizzled iron-gray median band narrowly bordered by band of black and edged externally with grayish white. Tail rather narrow.

Measurements.—Type specimen: Total length 525; tail vertebræ 260; hind foot 65. Average of 5 adults: Total length 522; tail vertebræ 267; hind foot 67.6.

Sciurus albipes effugius subsp. nov. Guerrero Squirrel.

Type from mountain near Chilpancingo, Guerrero, Mexico. No. 70288, ♀ ad., U. S. Nat. Mus., Biological Survey Coll. Collected Dec. 24, 1894, by E. W. Nelson and E. A. Goldman. Orig. No. 7271.

Distribution.—High pine region of the Cordillera del Sur, near Chilpancingo, Guerrero, Mexico.

Characters.—Size of *S. albipes*, from which it differs in the strongly marked nape patch, unusually large, conspicuous patches of white behind base of ear and rich rufous color on under side of tail. 2 upper premolars.

Color.—*Winter pelage:* Upper surface from nose to base of tail, excepting nape patch and tops of fore and hind feet, grizzled grayish white, black, and rufous, the latter color usually obscured by the overlying grayish. Top of head and nape occupied by a well-marked patch of dark rufous, almost chestnut, washed with black; nape patch shading into a duller colored area extending below eyes on sides of head and neck and surrounding ears; rump patch absent or reduced to small area at base of

tail, same color as nape. Ears grizzled grayish or dull rusty rufous on inner side; behind rufous or rusty gray anteriorly, posteriorly covered with long white fur, forming part of the conspicuous white patch behind base. Eyes surrounded by rings of fulvous and whitish; sides of nose and lower part of cheeks gray, varying in intensity. Tops of fore and hind feet white, shading through gray on legs to color of body. Anal region and base of tail all round like adjacent part of rump. Upper surface of tail black, washed with white, the bright rufous basal color sometimes showing through; below a median band of deep, rich rufous with scarcely a trace of dark grizzling, but bordered on each side by narrow band of black, edged with white. Chin white; sides of throat sometimes shaded with same; anal region gray; rest of lower parts deep rich rufous, very uniform in the series before me.

Measurements.—Type specimen: Total length 502; tail vertebræ 247; hind foot 68. Average of 5 adults: Total length 496.8; tail vertebræ 249; hind foot 68.

Remarks.—An old female in worn fur taken with the other specimens the last of December may represent the summer pelage. The rump patch is as conspicuous as the nape patch and agrees with it in color. The tops of fore and hind feet are dark gray; inside of legs dingy whitish shading into the dull whitish-rufous that covers throat, breast, and abdomen except ring of white around mammæ; chin white. The lower surface of tail is darker rufous than body and distinctly grizzled with black. Top of nose and area between nape and rump patches grizzled gray, black, and rusty rufous, the gray most conspicuous.

Among five adult winter specimens in the perfect pelage described above one is darker than the others on dorsal surface, owing to an increase in amount of black on tips of hairs. Another specimen has the rufous of under surface extending up on sides behind fore legs and uniting with a backward extension of the nuchal patch much like *S. aureogaster*. The rest of dorsal surface is less heavily grizzled with gray than usual and rusty-red predominates, so that the prevailing shade is dull rusty-red thinly grizzled with grayish white. The white on tops of feet is washed with reddish. Two half-grown young taken the last of December are in the same pelage as the adults, agreeing with the average adults except in having only the toes white and rest of feet gray. The nearest ally of this subspecies appears to be typical *S. albipes*. The white ear patches are more conspicuous than in any Mexican squirrel known to me.

Sciurus nelsoni hirtus subsp. nov. Popocatepetl Squirrel.

Type from Tochimilco, Puebla, Mexico. No. 55325, ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected Aug. 7, 1893, by E. W. Nelson and E. A. Goldman. Orig. No. 5295.

Distribution.—Volcanoes of Iztaccihuatl and Popocatepetl, in States of Mexico and Puebla, Mexico.

Characters.—Size of *S. nelsoni*, but distinguished by distinct patches of dingy fulvous on nape and rump; by iron-gray color on middle of back

and dingy rufous on under side of body. Ears and feet dark iron-gray. 2 upper premolars.

Color.—Dorsal surface from nose to base of tail, including tops of fore and hind feet, excepting nape and rump patches, finely grizzled with black and gray, the latter obscurely mixed with dull fulvous; gray of crown, nape, and rump mostly replaced by fulvous, thus producing distinct patches of dull dingy fulvous grizzled with black. Ears like nuchal area, with distinct patch of white fur behind base; chin dingy gray. Lower surface, including inside of forelegs and thighs, dark dingy rufous. Upper surface of tail black heavily washed with white; median band on lower surface varying from grizzled black and pale fulvous gray to black and rich buffy-fulvous; with a heavy band of black on each side edged externally with white. The tail has a remarkably broad full brush.

Measurements.—Type specimen: Total length 498; tail vertebræ 243; hind foot 67. Average of five adults: Total length 514.2; tail vertebræ 256.8; hind foot 68.

Sciurus aureogaster frumentor subsp. nov. Perote Squirrel.

Type from Las Vigas, Vera Cruz, Mexico. No 54259, ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected June 18, 1893, by E. W. Nelson and E. A. Goldman. Orig. No. 5073.

Distribution.—East slope of Cofre de Perote, Vera Cruz, Mexico, from near Las Vigas (7500 ft.) to Jico and Jalapa (4400 ft.).

Characters.—Size of *S. aureogaster*, from which typical specimens differ in having very distinct rufous patches on nape and rump, and grizzled gray lower surface. 2 upper premolars.

Color.—*Summer pelage* (Las Vigas): Top of nose and fore part of crown grizzled black and gray, sometimes slightly mixed with fulvous; nape and rump patches large and conspicuous, varying from dark orange-buffy to dark ferruginous; rest of back and sides, including tops of feet and legs, grizzled black and gray, or black, gray, and orange-buffy, the gray overlying the other colors. Tops of feet darker than back and usually blackish, thinly grizzled with gray. Ears generally like nape patch, but often grizzled with gray and sometimes with a whitish tuft behind base; narrow ring of dingy buffy round eye. Side of head between eye and ear, up to border of nape patch in front of ear, dark, dingy orange-buffy. Lower surface dingy grizzled black and gray nearly as on back, but paler on chin, lower cheeks, throat, and breast. Base of tail all round like rump. Upper surface of tail black, washed with white; below with a dark rufous median band broadly bordered on each side by black and edged externally with white.

Measurements.—Type specimen: Total length 500; tail vertebræ 253; hind foot 69. Average of 5 adults: Total length 504.6; tail vertebræ 249.8; hind foot 68.6.

Remarks.—*Winter pelage:* Two specimens taken in April at Jalapa are in winter pelage and differ from the large series of summer skins taken at Las Vigas and Jico in the greater amount of gray on the dorsal surface.

This overlies and obscures the nape and rump patches; the feet also are grayer. The under surface varies from grizzled gray to gray washed with dull rufous, and in two summer specimens from Las Vigas is dingy ferruginous In the series of 25 specimens from Jico and Jalapa only two are distinctly gray below and three are dingy reddish, washed with grayish. All of the others are intense ferruginous, which in some specimens extends up on sides, behind the forelegs, almost as in true *aureogaster*. The nape and rump patches, while averaging less uniformly distinct than in Las Vigas specimens, are almost invariably strongly marked and separate these specimens from true *aureogaster*. There is a tendency for the gray to extend over the nape and rump and so obscure these patches. The base and upper part of the tail is as in Las Vigas specimens; below the black lateral bands are broader and often reduce the rufous central stripe to a narrow streak on basal half. The rufous on tail is deeper than in Las Vigas specimens, varying from deep orange rufous to ferruginous. These specimens are intergrades between *frumentor* and true *aureogaster*, but the presence of distinct rump patches places them nearest *frumentor*. No melanistic phase is known.

Sciurus socialis cocos subsp. nov. Acapulco Squirrel.

Type from Acapulco, Guerrero, Mexico. No. 70644, ♂ ad., U. S. Nat. Mus., Biological Survey Coll. Collected Jan. 11, 1895, by E. W. Nelson and E. A. Goldman. Orig. No. 7360.

Distribution.—Pacific Coast district of Guerrero and adjacent part of Oaxaca (from Acapulco to Jamiltepec), Mexico.

Characters.—Distinguished from all Mexican squirrels by the sharp contrast between the bright rufous patches on nape and rump and the unusually pale or whitish color on rest of dorsal surface. 2 upper premolars.

Color.—Upper parts from nose to base of tail, except feet and patches on nape and rump, grizzled grayish-white, sometimes with slight mixture of rufous; darkest on nose and fore part of crown; on back and flanks, between the nape and rump patches, often almost white, contrasting strikingly with sharply defined patches on nape and rump, which vary from dark almost chestnut-rufous to deep orange-buffy, washed lightly with black. Eyes surrounded by dull fulvous ring in the middle of a fulvous or reddish-brown area which extends back on sides of head to ears and joins rufous nuchal patch on crown just in front of ears. Ears like nuchal patch, with a small patch of rufous or buffy fur behind base. Sides of nose and lower parts of cheeks grayish-white, this color often extending up to lower border of ears and back along sides of neck. Tops of feet white or pale grayish-white; chin white; rest of lower parts varying from white to pale creamy-buffy or rich buffy-rufous. Base of tail above like rump patch; below with anal region like middle of back; rest of tail on upper surface black, heavily washed with white with the rufous or orange-red under color showing through; below the median band varies from deep rufous to orange-rufous with a narrow black border edged externally and often more or less overlaid with white; sometimes

heavily washed with white below and above. The amount of white on tail agrees with purity of white on dorsal surface.

Measurements.—Type specimen: Total length 506; tail vertebræ 261; hind foot 67. Average of 5 adults: Total length, 515.4; tail vertebræ 263.2; hind foot, 67.

Remarks.—The most common or typical forms of this extremely variable squirrel are described above. They are notable among all of the species and races of the group having nape and rump patches for the sharp contrast between the rich dark color of these patches and the whitish or whitish-gray color on rest of upper surface which brings them out in sharp relief.

Vol. XII, pp. 157-160 August 10, 1898

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

ON SOME BIRDS FROM PUEBLO VIEJO, COLOMBIA.

BY OUTRAM BANGS.

Mr. W. W. Brown, Jr., has just sent to the Bangs collection the results of about two weeks' collecting at the village of Pueblo Viejo, in the high Sierra Nevada de Santa Marta, Colombia. The number of birds obtained was rather small, as his time was principally occupied in collecting mammals, which were found in much greater numbers than at the lower altitudes previously worked. All the birds here recorded, with the exception of one *Hemiprocne zonaris*, were taken at Pueblo Viejo, at about 8000 feet altitude, in the latter part of March, 1898.

I am deeply indebted to Dr. Chas. W. Richmond, of the United States National Museum, for his great kindness in looking over the birds and comparing them with skins in the National Museum collection. Indeed, without his valuable assistance I should have been unable to identify many of the species.

(Note.—All measurements are in millimeters.)

Porzana albigularis (Lawr.).

One adult, unsexed, taken Mar. 28, 1898.

Geotrygon linearis (Prév. & Knip).

One adult male, Mar. 28, 1898.

Syrnium virgatum Cassin.

One female, just emerging from immature plumage, Mar. 21, 1898.

Ramphastos brevicarinatus Gould.

One specimen.

Aulacorhamphus calorhynchus Gould.

Four males. All have larger bills than the one female I recorded in my last paper* from Santa Marta, the type locality of the species. The difference is doubtless sexual.

Anthocephala floriceps (Gould).

One fine adult male, taken Mar. 20, 1898, is, so far as I know, the only specimen of this extremely rare hummer in this country.

Hemiprocne zonaris (Shaw).

One adult male, taken at Santa Marta, Colombia, Feb. 18, 1898. Not quite typical. Wing, 193; tail, 72; length (skin), 198; about the size of *H. zonaris albicincta* (Cab.), but the white collar is wider instead of narrower on the upper side.

Mionectes olivaceus Lawr.

Two males, taken Mar. 20, 1898.

Elænia browni sp. nov.

Type (and only specimen), from Pueblo Viejo, Colombia. No. 5573, ♂ adult, coll. of E. A. and O. Bangs. Collected Mar. 23, 1898, by W. W. Brown, Jr. Altitude 8000 ft.

Specific characters.—Nearest *E. mesoleuca* Cab. & Heine, of Brazil, but smaller; olive green of upper parts browner (darker); axillaries, under wing-coverts, sides of body, and under tail-coverts less yellow; throat pale yellowish green, instead of grayish white.

Size.—♂ adult: wing, 72.2; tail, 64.4; exposed culmen, 10.

Myiodynastes chrysocephalus (Tschudi).

One female, March 21, 1898.

Myiobius nævius (Bodd.).

One male, Mar. 21, 1898. The crest is red.

Myiarchus nigriceps Scl.

Two specimens, male and female.

Tityra semifasciata (Spix).

Two specimens, male and female.

Automolus rufipectus sp. nov.

Type (and only specimen), from Pueblo Viejo, Colombia. No. 5580, ♂ adult, coll. of E. A. and O. Bangs. Collected Mar. 21, 1898, by W. W. Brown, Jr. Altitude 8000 feet.

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* Proc. Biol. Soc. Wash., XII, p. 134, June 3, 1898.

Specific characters.—Back and top of head dark olive-brown; forehead and auriculars chestnut-rufous; wings rufous, darker on outer webs, brighter on inner; ends of primaries dusky; upper and under tail-coverts and tail chestnut-rufous; throat buff; chest rufous, this color forming a conspicuous band and extending along neck to auriculars; center of belly tawny-olive shading to raw umber on sides and flanks.

Size.—♂ adult: wing, 83.2; tail, 77; exposed culmen, 23.

Remarks.—*A. rufipectus* is apparently very different from any of the described species, its rufous chest being distinctive.

Conopophaga sp. ?

One female, which cannot be properly identified at present. It has no white tufts on sides of head.

Cassidix oryzivora (Gmelin).

Two males.

Buarremon basilicus sp. nov.

Type (and only specimen), from Pueblo Viejo, Colombia. No. 5598, ♂ adult, coll. of E. A. and O. Bangs. Collected Mar. 21, 1898, by W. W. Brown, Jr. Altitude 8000 ft.

Specific characters.—Nearly related to *B. torquatus* (d'Orb. & Lafr.) from Bolivia, but differing from that species in gray instead of white superciliary stripe; in reddish olive instead of olive green back, rump, wing-coverts, edges of tail, wing feathers, tail-coverts and sides of body; in pale fawn-color instead of white breast and center of belly; in wider black band across chest; and in larger bill.

Size.—♂ adult: wing, 81.2; tail, 78.8; exposed culmen, 17.4.

Remarks.—This new species is probably nearly related to *B. poliophrys* (Berl. and Stolz.), which has the same slate-gray superciliary stripe. *B. poliophrys* is said to be otherwise like *B. torquatus*, while the Pueblo Viejo bird has a larger bill and many differences in color.

Sporophila sp. ?

One female. The species cannot be determined by this skin, which is not in distinctive plumage.

Calospiza desmaresti (Gray).

Two males.

Calospiza cyanoptera (Swains.).

Two males of the bird which I recorded in my last paper* as '*Calospiza* sp. ?' on the basis of a female specimen.

Ramphocelus dimidiatus Lafr.

Eight specimens, including males and females.

* Proc. Biol. Soc. Wash., XII, p. 141, June 3, 1898.

Tachyphonus rufus (Bodd.).

Four specimens, a male and three females.

Helminthophila chrysoptera (Linn.).

One adult female, Mar. 20, 1898, winter resident.

Basileuterus cinereicollis Scl.

One male.

Thryothorus laetus sp. nov.

Type (and only specimen), from Pueblo Viejo, Colombia. No. 5601, ♂, coll. of E. A. and O. Bangs. Collected Mar. 19, 1898, by W. W. Brown, Jr. Altitude 8000 ft.

Specific characters.—Resembling in general style of coloration *T. rutilus* Vieillot, but feathers of russet chest and white breast and upper abdomen marked with black subterminally, giving a mottled appearance to the under parts.

Size.—♂, wing, 59.6; tail, 49.4; exposed culmen, 17.

Remarks.—At first glance the type and only specimen of *T. laetus* gives one the impression of a spotted young, but a closer examination shows that this is not so. The feet and bill are those of an adult and the plumage shows no signs of immaturity.

Henicorhina leucophrys (Tschudi).

One adult male.

Catharus aurantiirostris (Hartl.).

One adult male.

Merula phæopyga (Cabanis).

Two males. These are not exactly the same as a specimen from British Guiana (presumably taken near the type locality) in the National Museum collection. Neither can they be referred to *M. phæopyga spodiolæma* (Berl. and Stolz.) of central Peru, or to *M. phæopyga saturata* (Berl.) of Bogota. It is very likely that they represent still another subspecies of this wide-ranging and variable thrush.

Vol. XII, pp. 161-165 August 10, 1898

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTIONS OF SOME NEW MAMMALS FROM THE SIERRA NEVADA DE SANTA MARTA, COLOMBIA.

BY OUTRAM BANGS.

In the fine material already sent to the Bangs collection by W. W. Brown, Jr., from the Santa Marta region of Colombia are apparently five new mammals. The collections contain many other species, including wide-ranging tropical-forest forms, and other species the exact identity of which I have not yet determined. The present paper contains merely preliminary descriptions of some of the new forms, but I hope to be able later on to give a full account of all the mammals Mr. Brown secures in this region.

Mr. Oldfield Thomas has kindly compared some of the small rodents with the types in the British Museum from Bogota, Colombia, and Merida, Venezuela. He finds that the Santa Marta animals have closer affinity with those from Merida than with those from Bogota.

Philander cicur sp. nov.

Type from Pueblo Viejo, Colombia, altitude 8000 ft. No. 8114, ♀ adult, coll. of E. A. and O. Bangs. Collected March 27, 1898, by W. W. Brown, Jr.

General characters.—Size large; tail longer than head and body, hairy above for about half of its length, below for about one-fourth its length; no gray stripe on back; upper surface of arms deep hazel.

Color and *Pelage.*—Fur long, dense and soft; hairs of upper parts rich brown, between hazel and russet, at tips, mouse gray at base, the gray color showing through in places, especially about shoulders and along lower sides; no gray mark or stripe on back; face dark gray; a narrow dark brown stripe from nose to between ears, where it merges into brown of occiput; a dark brown circle around eye; base of whiskers dusky; whiskers black; under parts yellowish white, purest on belly and along median line, grayer on sides and under surface of neck; arms bright hazel above, yellowish white below; legs hazel near feet, gray near body;

feet and hands pale brown, in dried skin; ears hairy at base outside, naked inside and for rather more than half their length outside; a gray mark across base of ear, rest of hairs brown; tail naked above for about half its length, below for about three-fourths its length; hairy portion of tail brown, like back, but the hairs unicolor throughout their entire length; naked portion, in dried skin, yellow, with some irregular black spots, all near where the hair ends; "testicles glaucous blue." *

Measurements.

No.	Locality.	Sex.	Total length.	Tail vert.	Hind foot.	Ear from notch.
8114	Pueblo Viejo, Colombia	♀ ad.	580	335	36	33
8115	" " "	♂ ad.	580	325	37	30
8116	" " "	♂ yg. ad.	510	280	35	31
8036	Near Santa Marta, Colombia, 4000 ft.	♂ ad.	610	370	40	32

Skull, type, ♀ adult: basal length, 49; zygomatic width, 30.8; mastoid width, 20.2; interorbital width, 9.8; width across postorbital processes, 15; length of nasals, 21.6; greatest length of single half of mandible, 39.2.

Remarks.—This handsome *Philander* is represented by four examples, three taken at Pueblo Viejo at an elevation of 8000 ft. and one taken on top of a small mountain near Santa Marta at 4000 ft. The Santa Marta skin has a much longer tail and larger hind foot than any of the others, but otherwise they are all four very similar. *P. cicur* is apparently nearest to *P. derbianus*, but differs from that species in having rich brown instead of white upper sides to arms and in lacking the gray dorsal stripe. Another species that may be somewhat closely related is the *P. ornatus* Tschudi of Peru, but this also has the gray dorsal stripe, which is wholly absent in *P. cicur*.

Marmosa mitis sp. nov.

Type from Pueblo Viejo, Colombia, 8000 ft. No. 8123, ♂ adult, coll. of E. A. and O. Bangs. Collected Mar. 25, 1898, by W. W. Brown, Jr.

General characters.—Nearest to *M. murina*, but slightly smaller; color above less ferruginous, and much paler, especially on middle of face; skull slightly different.

Color and *Pelage.*—Pelage short, dense, soft; upper parts varying from dull tawny-olive to pale bistre, darkest along dorsal line and shading on sides of neck and lower sides to cinnamon-buff; under fur slaty; middle of face between black eye-spots much paler—wood brown; under parts, chin, neck, inside of arms, chest and belly yellowish white, in some specimens somewhat suffused with buffy, the hairs one color to their base; lower sides more strongly buffy, the hairs slate color at base; feet and

* Note made by Mr. Brown from fresh specimens.

hands dull white; tail indistinctly bicolor, brownish dusky above, grayer below, clothed with very short appressed hairs.

Cranial characters.—The skull as compared with that of *M. murina* differs in greater postorbital constriction and higher, heavier rostrum. The nasals are broad and heavy, slightly arched, and the maxillaries somewhat swollen laterally.

Measurements.—The type, ♂ adult: total length, 325; tail vertebræ, 175; hind foot, 22; ear from notch, 24. An old adult ♀ topotype, No. 8139, total length, 325; tail vertebræ, 185; hind foot, 21; ear from notch, 24. Average of ten adults, ♂ and ♀, topotypes, total length, 321.7; tail vertebræ, 176; hind foot, 21.6; ear from notch, 24.3.

Skull, the type, ♂ adult: basal length, 36.2; occipitonasal length, 39.4; zygomatic width, 20.6; mastoid width, 14; width between orbits, 6.2; length of nasals, 18.6; width of nasals, 5.2; greatest length of single half of mandible, 29.

Remarks.—Mr. Brown took twenty-seven examples of *M. mitis* at Pueblo Viejo at 8000 feet altitude, but did not secure any at lower elevations. *M. mitis* is probably nearest to *M. murina*, but differs in slightly smaller size, in color, and in cranial characters. *M. fuscata* Thomas, of Merida, Venezuela, is perhaps also somewhat closely related. It differs in having the hairs of the under parts slaty at base and in its smaller size and different cranial proportions.

Dasyprocta colombiana sp. nov.

Type from Santa Marta, Colombia. No. 8008, ♀ young adult, coll. of E. A. and O. Bangs. Collected Jan. 6, 1898, by W. W. Brown, Jr.

General characters.—Size medium; general color dark; hairs on back of head and neck slightly elongated, but not forming decided crest; hairs of rump black with white tips.

Color and *Pelage.*—Hairs stiff and coarse; back, shoulders, and head, black, each hair with an ochraceous band near tip, this band shorter on hairs of center of back and longer on those of sides; elongate hairs of rump black with white tips; under parts, center of belly, median line, and throat whitish; under side of neck and lower sides, hairs annulated like those of back, but the yellow bands rather paler; legs and arms, feet and hands black, slightly lined with yellow; ears sparsely haired, rather more hairy at base than at tip, the hairs ochraceous.

Measurements.

No.	Locality.	Sex.	Total length.	Tail vert.	Hind foot.	Ear from notch.
8008	Colombia, Santa Marta ..	♀ yg. ad.	500	25	126	40
8113	Colombia, Pueblo Viejo ..	♂ yg.	470	30	115	36

Skull, the type, ♀ young adult: basal length, 189.4; zygomatic width, 49.1; mastoid width, 36; width between orbits, 28.6; width across postorbital processes, 38.6; length of nasals, 42.4; greatest length of single half of mandible, 58.2.

Remarks.—Mr. Brown has thus far sent two specimens of this agouti, one, the type, a female, taken at Santa Marta, probably full grown, though not quite adult, has the last molar on both upper and under jaw just coming into place. The other is a younger male taken at Pueblo Viejo at 8000 feet. Both agree perfectly in coloration.

D. colombiana appears, so far as I can judge by descriptions, to be very different in color from any of the neighboring species, the peculiar coloring of the rump being distinctive. Unfortunately, through lack of material, I can say nothing of its cranial characters at present.

Oryzomys flavicans illectus subsp. nov.

Type from Pueblo Viejo, Colombia, altitude 8000 ft. No. 8101, ♂ adult, coll. of E. A. and O. Bangs. Collected March 24, 1898, by W. W. Brown, Jr.

General characters.—Similar in size, proportions and cranial characters to *O. flavicans* Thomas, of Merida, Venezuela; differs in color of under parts, which are a beautiful rich orange-buff to base of hairs—the under parts of true *flavicans* being whitish.

Color.—Upper parts, bright yellowish brown, about tawny-ochraceous, a scattering of dark brown hairs along back and on top of head; lower sides and under parts orange-buff; usually a small white spot on throat; hairs of upper parts and sides slate gray at base, those of belly, chest and throat unicolor for their whole length; feet and hands buff.

Measurements.—The type, ♂ adult: total length, 292; tail vertebræ, 160; hind foot, 25; ear from notch, 17. Average of five adult topotypes, ♂s and ♀s: total length, 279.4; tail vertebræ, 146.8; hind foot, 26; ear from notch, 17.2.

Tayassu torvus sp. nov.

Type from Santa Marta, Colombia. No. 8038, ♂ adult, coll. of E. A. and O. Bangs. Collected Jan. 26, 1898, by W. W. Brown, Jr.

General characters.—Size smaller than either *T. tajacu* of southern Brazil or *T. angulatus* of Texas. Color and external characters as in those two species. Skull smaller and otherwise different.

Cranial and *dental characters.*—Skull low, short and wide; nasals short, taken together, evenly rounded and rather flat; malar crest continued forward to canine alveolus. Molar teeth not wrinkled; molars and premolars all very large; two small upper premolars molariform, quadrate and quadritubercular; the small anterior lower premolar with the forward large tubercule divided into two, like next premolar. In *T. tajacu* this tooth has the forward large tubercule plain and single, differing in this from the next premolar.

The skull of *T. torvus* can be distinguished from that of *T. tajacu* in the extension of the malar crest forward to canine alveolus; in much larger

molars and premolars; in the two smaller upper premolars being distinctly quadritubercular and quadrate; in the form of the small anterior lower premolar. From *T. angulatus* it can be distinguished by nasals not being angulated in the middle line and molars not being wrinkled. From both *T. angulatus* and *T. tajacu* it differs by being shorter, lower, and wider, and by the larger molar and premolar teeth.

Measurements.—The type, ♂ adult: head and body, 1075; hind foot, 170; ear from notch, 75.

Skull: basal length, 186; zygomatic width, 95.4; width between orbits, 50; width across postorbital processes, 71.4; width of palate at forward alveoli of last molars, 23; greatest length of single half mandible, 156; length of molar series (molars and premolars, alveoli)—upper, 67.8; under, 74.

Remarks.—Mr. Brown has thus far sent but one specimen, the type, a fine old male skin and skull. This specimen is, however, so different from either *T. tajacu* of southern Brazil or *T. angulatus* of Texas that I feel justified in separating it. Whether it is a species or only a race of *T. tajacu* can, of course, not be told without much more material than is now available.

When Prof. Cope named the Texan peccary *angulatus* * he irrevocably restricted the Linnæan name *tajacu* to the peccary of southern Brazil.

Through the kindness of Mr. Witmer Stone, I have been able to compare my Santa Marta skull with two of Prof. Cope's original southern Brazil skulls that had come into the collection of the Academy of Natural Sciences.

* Am. Nat., Feb., 1889, pp. 146-147.

VOL. XII, PP. 167-168 AUGUST 10, 1898

PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

BIOLOGICAL LIBRARY

A NEW RACE OF THE LITTLE HARVEST MOUSE FROM WEST VIRGINIA.

BY OUTRAM BANGS.

Within the last year Mr. Thaddeus Surber has found that the Little Harvest Mouse is comparatively common in the country about White Sulphur Springs, W. Va. He has sent me five specimens and has taken several more that are in his own private collection. The one specimen taken at Fort Myer, Va., by L. Z. Mearns* is the only other record I know for this mouse from so far north in the eastern United States On comparing these West Virginia specimens with true *Reithrodontomys lecontii* from Georgia and northern Florida some differences in color, proportions, and cranium can be seen, and I propose to separate the northern form as follows:

Reithrodontomys lecontii impiger subsp. nov.

Type from White Sulphur Springs, W. Va. No. 7784, ♂ old adult (with much worn teeth), coll. of E. A. and O. Bangs. Collected Feb. 27, 1898, by Thaddeus Surber. Original No. 466.

General characters.—Size a little smaller than true *R. lecontii;* tail slightly shorter; ear much smaller; pelage longer and softer; colors of back richer brown, sides paler, the contrast in color between sides and back more marked; skull smaller, more slender and lighter throughout; molar teeth rather larger.

Color.—Adult in winter pelage, upper parts dark russet brown, rather darker along middle of back and on rump, sides much paler, almost ochraceous buff on lower sides; under parts grayish white, irregularly washed, in some specimens, with fawn color; feet and hands grayish

* Recorded in Am. Nat., XXXI, p. 161, Feb., 1897.

white; ears dusky, with some reddish brown hairs on both inner and outer surfaces; tail indistinctly bicolor, dusky above, grayish white below, rather more hairy than in true *R. leconlii;* under fur plumbeous throughout except on chin and under side of head, where the hairs are whitish to their base.

Measurements.

No.	Sex.	Total length.	Tail vert.	Hind foot.	Ear from notch (dried skin).
7784	Type, ♂ adult	112	51	15	9
6932	Topotype, ♂ adult	115	51	15	9
7785	" ♀ adult	120	53	15	8.5

Remarks.—Specimens from Raleigh, N. C., of which there are many in collections, taken by the Brimley brothers, appear to be intermediates, though nearer true *R. leconlii.* In *R. leconlii impiger* the ear is much smaller than in all specimens I have examined from Georgia and northern Florida. For instance, an adult ♀ *R. leconlii leconlii* taken by W. W. Brown, Jr., at Pinetucky, Ga., measures: Total length, 136; tail vertebræ, 62; hind foot, 16; ear from notch, 12 (in dried skin 11.5). Judged by the skulls, this specimen is younger than the type of *R. leconlii impiger.* These differences in size and proportions, combined with the differences in color and the smaller and more delicate skull of *impiger,* serve to distinguish all specimens I have examined from extreme localities.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

DESCRIPTION OF A NEW WEASEL FROM THE QUEEN CHARLOTTE ISLANDS, B. C.

BY EDWARD A. PREBLE.

Last spring I received through the kindness of Rev. J. H. Keen, of Massett, Queen Charlotte Islands, a fine adult weasel in alcohol. As it had not been long immersed, I skinned it at once in order to preserve its color, and presented the specimen to the Biological Survey Collection in the U. S. National Museum. The skin is in late winter pelage, the dark fur of the summer coat just beginning to appear on the head and back.

I was not surprised, considering the isolated habitat, to find that this weasel belonged to an undescribed species, which may be characterized as follows:

Putorius haidarum * sp. nov.

Type from Massett, Queen Charlotte Islands, B. C. Skin and skull No. 94430, U. S. Nat. Mus., Biological Survey Coll. Collected March 17, 1898, by Rev. J. H. Keen.

Geographical distribution.—Known only from the type locality.

General characters.—Similar in general characters to *Putorius kadiacensis* from Kadiak Island, Alaska, but differing in smaller size, in the increased amount of black on tail, and in cranial characters; also apparently differing greatly in color of the summer pelage.

Color of type.—White, slightly tinged posteriorly and beneath with saffron yellow. Terminal portion of tail, comprising about 60 per cent. of the entire length, black. Small spots of summer fur just appearing on face, top of head, and back, blackish-brown.

Cranial characters.—The skull is about the size of *Putorius cicognani*, but

* Dedicated to the Haidas, the resident tribe of Indians.

requires no comparison with that species, being much more stoutly built and angular. Compared with *Putorius kadiacensis*, which is undoubtedly its nearest relative, the skull of the present species is considerably smaller, with flatter braincase, mandible more deflected, post-palatal notch much smaller, relatively and absolutely. Zygomata very slender throughout, post-molar production of palate longer and narrower, and post-glenoid space longer and more swollen. Bullæ smaller and flatter. Teeth throughout much smaller than in *P. kadiacensis*.

Remarks.—By a fortunate coincidence the type of the present species and the type of *P. kadiacensis*, with which it requires comparison, agree exactly in condition of pelage. Both are also adult males of almost precisely the same age, a circumstance which makes the comparison simple and satisfactory. The fur of *P. haidarum* is finer than that of *P. kadiacensis*. In the latter species the summer fur just appearing is light-brownish in color, thus contrasting quite strongly with the blackish brown of the corresponding portions of *P. haidarum*. The terminal portion of the tail of *P. kadiacensis* is considerably suffused with brownish, while in *P. haidarum* it is pure black. The type of *P. kadiacensis* measured in the flesh: Total length, 318; tail vertebræ, 86; hind foot, 44; pencil of tail, 40. *P. haidarum* measured in flesh: Total length, 275; tail vertebræ, 60; hind foot, 37; pencil of tail, 40. The black portion of the tail measured about 60 mm. in each case, thus comprising about 60 per cent. of the entire length of the tail in *P. haidarum* and about 50 per cent. in *P. kadiacensis*.

The type skull of *P. haidarum* measured as follows: Basal length, 38; zygomatic breadth, 22.5; mastoid breadth, 19; breadth across post-orbital processes, 13; interorbital breadth, 10.5; foramen magnum to posterior plane of molars, 25; palatal length, 15.5; post-palatal length, 20.5.

Unfortunately this skull was infested with parasites, and therefore the measurement of the breadth across post-orbital processes may not be exactly correct.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

ON SOME BIRDS FROM THE SIERRA NEVADA DE SANTA MARTA, COLOMBIA.

BY OUTRAM BANGS.

Mr. W. W. Brown, Jr., has recently sent a third lot of birds, including about three hundred skins, to the Bangs collection. These specimens were collected during May and June, 1898, at the following localities in the Sierra Nevada de Santa Marta, Colombia: Palomina, altitude 5000 feet; San Francisco, 6000 feet; San Miguel, 7500 feet; and Macotama, 8000 feet. Many of the birds are in worn breeding plumage, and some of the species are also represented by young in first plumage. Again I am in debted to Mr. R. Ridgway and Dr. C. W. Richmond for aid in determining many species.

(Note.—All measurements are in millimeters. Colors, when definite names are used, are according to Ridgway's Nomenclature of Colors.)

Neocrex colombianus sp. nov.

Type (and only specimen), from Palomina, Colombia, No. 5700, ♀ adult, coll. of E. A. and O. Bangs. Collected May 22, 1898, by W. W. Brown, Jr. Altitude, 5000 feet.

Specific characters.—This species resembles in a general way the only other member of the genus—*N. erythrops* Scl. of Lima, Peru, but differs much in details of coloration and markings—lower abdomen white instead of dusky brown; lower flanks and under tail-coverts, *unbarred*, pale, cinnamon instead of blackish; under wing-coverts white, some of the feathers faintly streaked with dusky, instead of "dusky brown narrowly barred with white."

Color.—Adult ♀, back, rump, upper tail-coverts and wings (except primaries) bistre; primaries hair brown, narrowly edged with bistre; tail bistre, the center and base of the feathers shading towards hair brown;

pileum brownish slate, some of the feathers tipped with dark bistre; throat white; sides of head, sides of neck, jugulum, breast and abdomen slate gray; center of belly pure white; flanks and under tail-coverts pale cinnamon, without a trace of any barring whatever; bend of wing and under wing-coverts white, a few of the feathers slightly streaked or spotted with very pale and indistinct markings of hair brown; axillars pale bistre; 'tarsus red; base of bill red, tip green.' *

Size.—♀ adult: Length, skin, 148; † wing, 93.2; tail, 29; exposed culmen (approximately, a shot having broken base of upper mandible), 18.8; tarsus, 30.

Remarks.—I have had no specimens of *N. erythrops* for comparison; but Sclater's original diagnosis, as well as Sharpe's description of an adult female, in the British Museum,‡ indicate a bird so different from mine as to leave no doubt of the specific distinctness of the two.

Porzana albigularis (Lawr.).

Two adult males from Palomina, May.

Columba albilinea Bp.

One adult female from Palomina.

Falco sparverius Linn.

Two adults, male from Palomina, June 22; female from San Miguel, June 14.

Conurus wagleri Gray.

Seventeen adults, males and females, from Palomina and San Miguel.

Pionus sordidus (Linn.).

One adult male from San Miguel, June 17, 1898.

Crotophaga ani Linn.

One female from Palomina.

Aulacorhamphus calorhynchus Gould.

Two adult males from Palomina. In my two former papers on the birds collected by Mr. Brown I wrongly gave the type locality of this species as Santa Marta. It is really Merida, Venezuela.

Mr. Brown has now sent seven specimens. This series shows great va-

* Note made by Mr. Brown from the fresh specimen.

† Mr. Brown's skins are rather smaller than those of most collectors, but as this measurement is only approximate in any case, I give it for what it is worth.

‡ Cat. Birds Brit. Mus., XXIII, 1894, 163.

riation in the length of the bill, which certainly does not depend upon sex, but seems to be individual.

I have some doubt whether the bird from the Sierra Nevada de Santa Marta is subspecifically the same as that of the Andes of Venezuela, but without material from the type locality I cannot be sure. All my specimens have a large black mark at the base of the culmen; the end of the tail is strongly bluish; and there is a wash of dark olive yellow on the sides of the head.

Aulacorhamphus lautus* sp. nov.

Type (and only specimen), from San Miguel, Colombia. No. 5789, ♂ adult, coll. of E. A. and O. Bangs. Collected June 6, 1898, by W. W. Brown, Jr. Altitude, 7500 ft.

Specific characters.—Not much like any described species. Among the species having chestnut tips on rectrices it agrees in color of throat only with *A. albivittatus*, but is a much smaller bird, lacks the chestnut basal portion of mandible, and has the basal portion of culmen black, besides differing in several minor particulars. In pattern of bill the new species agrees best with *A. cæruleogularis* of Costa Rica and Veragua, but differs in the absence of the chestnut spot at base of yellow maxillary stripe, and in having a gray instead of deep blue throat.

Color.—Upper parts grass green—more bluish on wings, more yellowish on back; primaries and inner webs of secondaries dusky, with narrow yellow border on inner edges; a small blue supraorbital stripe; throat cinereous; breast and abdomen pale grass green to apple green; feathers of center of belly white at base; crissum chestnut; tail, above, green, bluish towards end, each feather tipped with chestnut; below, black, each feather tipped with chestnut; bend of wing and under wing-coverts pale yellow. Bill, maxilla, tip and stripe along culmen which divides at base of culmen and encloses a large black patch, yellow; sides and patch at base of culmen black; mandible black; a broad yellowish white stripe across base of maxilla and mandible.

Size.—Length (skin), 291; wing, 124; tail, 108.8; exposed culmen, 69.6; tarsus, 34.

Phœthornis longirostris (Less. and De Latt.).

Four adults, three males and one female, from Palomina.

Petasophora iolata Gould.

Twenty-eight adults, males and females, from Macotama and San Miguel—May and June.

Leucuria gen. nov. (**Trochilidæ**).

Type.—*Leucuria phalerata*, sp. nov.

Characters.—Related to *Helianthea* and also to *Hemistephania*. Bill long,

* Lautus = neat, elegant, in a fine dress.

straight, cylindrical (slightly shorter and broader than in *Helianthea*); wings reaching about to end of tail; tarsus naked with the exception of a bunch of white feathers near heel; tail long, broad, forked, pure white; upper and under tail-coverts white; whole crown, forehead, and lores metallic.

(For size, colors, and arrangement of colors, see description of type species below.)

Leucuria phalerata sp. nov.

Type (and only specimen) from Macotama, Colombia. No. 5731, ♂ adult, coll. of E. A. & O. Bangs. Collected June 17, 1898, by W. W. Brown, Jr. Altitude, 8000 ft.

Color.—Forehead, crown and lores very brilliant metallic blue, with, in some lights, green reflections; auriculars, back and wing-coverts dark grass green, in some lights quite dusky on cervix and upper back; chin dark grass green with slight metallic reflections; throat metallic violet; breast metallic sea green; abdomen shining grass green; wings purplish-brown; feathers of tarsi, upper and under tail-coverts and tail, including shafts of feathers, pure white.

Size.—♂ adult: Length (skin), 120; wing, 72.2; tail—longest rectrix, 47, shortest rectrix, 35.6; culmen, 26.8; greatest width of outer rectrix, 9.8.

Remarks.—Of this fine hummer Mr. Brown has taken but one adult male—the only one seen in months of collecting. This adds another striking local species of humming bird to the five already described from the Sierra Nevada de Santa Marta.

Thalurania columbica (Bourc.).

Two adults, male and female, from San Miguel and Palomina.

Metallura smaragdinicollis (D'Orb. and Lafr.).

Two adults; male from Palomina, May 10, female from San Miguel, June 12, 1898.

Panychlora russata Salv. and Godm.

Six adults, five males and a female, from San Miguel and Palomina, May and June.

Myiotheretes striaticollis Scl.

One adult male from Macotama, June 17, 1898.

Ochthoeca poliogaster Salv. and Godm.

One adult female from Macotama, June 17, 1898.

Sayornis cineracea (Lafr.).

One young in first plumage from San Miguel, June 4, 1898.

Tyranniscus chrysops (Scl.).

Two males, one adult, the other young, from Palomina.

Elænia browni Bangs.

Five adults from San Miguel, June.

Elænia sororia sp. nov.

Eleven adults, males and females, ten from Palomina, May, and one from San Miguel, June 16, 1898.

Type from Palomina, Colombia, No. 5826, ♀ adult, coll. of E. A. and O. Bangs. Collected May 10, 1898, by W. W. Brown, Jr. Altitude, 5000 ft.

Specific characters.—Similar to *E. browni*, but darker and not so greenish above; cap considerably darker than the back (nearly uniform in *E. browni*); concealed white at base of crown pronounced (nearly obsolete in *E. browni*); inner web of innermost tertiary only edged with white (wholly white in *E. browni*); patch of greenish-yellow edging on outer webs of secondaries not so bright and pronounced as in *E. browni;* lining of wing strongly tinged with buff—clear yellow in *E. browni;* bill more robust and not so compressed near the tip.

Color.—Adult in somewhat worn plumage; upper parts dull olive brown (almost hair brown); cap darker than back; large concealed white patch on center of crown; wing bars, edgings of primaries, secondaries, and tertials yellowish or greenish white; lining of wing buffy; throat dull gray; breast, sides and flanks brownish gray; abdomen and under tail-coverts pale yellow to yellowish white.

Size.—♂ adult, Topotype, No. 5827: Length, skin, 134; wing, 77; tail, 66; exposed culmen, 10.8; tarsus, 17.4. ♀ adult, Type—Length, skin, 128; wing, 73; tail, 63.2; exposed culmen, 10.6; tarsus, 17.

Remarks.—*E. browni* and *E. sororia* are closely related, though entirely distinct species. From the material Mr. Brown has so far collected, I should judge that *E. sororia* is found at rather lower elevations than *E. browni*, though their ranges meet. At Palomina Mr. Brown found only *E. sororia*. At San Miguel he took five examples of *E. browni* and one of *E. sororia*. The molting season of the two species appears to be different, as the specimens of *E. browni* shot at different dates in June at San Miguel are all in fresh plumage, while all the examples of *E. sororia* taken at Palomina in May and the one killed at San Miguel, June 16, are in somewhat worn plumage. The great difference in color between the two series may be in part seasonal; but *E. sororia* is probably never very greenish on the upper surface.

Both *Elænia browni* and *E. sororia* seem to belong in that section of the genus called *Myiopagis* by Salvin and Godman:* a group I should be unwilling to allow even subgeneric rank.

* Biol. Cent.-Am., Aves, II, 1888, 26 (Type *Elainea placens* Scl.).

Myiozetetes texensis colombianus (Cab. and Heine).

One adult female from Palomina.

Rhynchocyclus sulphurescens (Spix).

Three adults, two males and one female, from Palomina.

Myiodynastes audax nobilis (Scl.).

One adult male from Palomina.

Myiodynastes chrysocephalus (Tschudi).

One adult female from San Francisco.

Megarhynchus pitangua (Linn.).

One adult male from Palomina.

Myiobius vieillotioides (Lafr.).

One adult male from San Francisco, June 1, 1898.

Myiobius nævius (Bodd.).

One adult female from Palomina. The crest is yellow slightly tinged with orange.

Myiarchus nigriceps Scl.

Ten specimens from Palomina and San Miguel. Nine are adults in rather worn plumage and one is a young bird in first plumage.

Tyrannus melancholicus satrapa (Licht.).

Ten adults, including both sexes. Eight are from Palomina and two from Macotama. The Macotama birds have larger bills than those from Palomina but otherwise do not seem to differ.

Milvulus tyrannus (Linn.).

Five specimens from Palomina, four adults and one young in first plumage.

Formicivora caudata Scl.

Two specimens, one a male and the other probably a female, from Palomina, taken in May and June.

It is very probable that these are not true *F. caudata* Scl., which is said to have black rectrices tipped with white. The Palomina birds have brown tails, with a subapical black band and white tips; they may not, however, be fully adult.

Synallaxis albescens Temm.

Five adults, males and females, from Palomina, May.

Synallaxis fuscorufa Sel.

Three adults, two males and one female, from San Miguel, May and June. These appear to be *S. fuscorufa*, the type locality of which is San Sebastian, Colombia, though they do not agree well with Sclater's description, in which the back is said to be brown. The San Miguel specimens are in somewhat worn plumage, with the back rather gray than brown—a grayish hair brown—the breast ferruginous rather than cinnamon, and little paler than the cap.

Xiphocolaptes procerus Cab.

One adult female from Macotama June 24. Judged by descriptions, this specimen is *X. procerus*. Mr. Ridgway has examined the skin and is of also this opinion.

Sclerurus albigularis Swains. (subsp. nov. ?).

One adult female from Palomina, May 18.

This skin Mr. Ridgway has compared with a specimen of *S. albigularis* from Tobago, and with the type of *S. canigularis* from Costa Rica, and finds that it is exactly intermediate. If more specimens from the same region should prove the characters of this intermediate race to be constant it might be well to give it a subspecific name.

Grallaria spatiator sp. nov.

Type (and only specimen) from Macotama, Colombia. No. 5683, ♂ adult, coll. of E. A. and O. Bangs. Collected June 17, 1898, by W. W. Brown, Jr. Altitude, 8000 ft.

Specific characters.—Resembling *G. rufula*, but with much shorter bill; longer and more slender tarsus; and darker, duller brown coloration.

Color.—Upper parts, about mummy brown, many of the feathers shaded by a more reddish olive tinge; primaries dusky edged with russet; tail mummy brown; chin whitish; throat and breast cinnamon-russet; flanks raw umber; lower abdomen and crissum soiled white, the feathers somewhat marbled with raw umber and russet.

Size.—♂ adult: Length, skin, 132; wing, 83.6; tail, 42; exposed culmen, 20; tarsus, 46.

Ostinops decumanus (Pall.).

Two adults, male and female, from Palomina.

Cassidix oryzivora (Gmel.).

Four specimens, adult males, and female, and young male, from Palomina.

Spinus spinescens capitaneus subsp. nov.

Three adult males from San Miguel.

Type.—From San Miguel, Colombia. No. 5674, ♂ adult, coll. of E. A. and O. Bangs. Collected June 14, 1898, by W. W. Brown, Jr. Altitude, 7500 ft.

Subspecific characters.—Like true *S. spinescens* but much larger; bill very much larger.

Color.—Adult ♂: Forehead and crown black; occiput, cervix, back and upper tail-coverts dark oil green, slightly touched with indistinct dusky markings; lower rump bright olive green; wings black, crossed by a broad yellow band, middle and greater coverts tipped with oil green; secondaries edged with green, tipped with whitish; primaries narrowly edged with green and just tipped with whitish; under parts between oil green and olive yellow, more green on throat, upper breast, sides and flanks, more yellow on lower breast, upper abdomen and under tail-coverts; center of belly white; tail black, yellow at base.

Size.—Adult ♂: Length, skin, 106; wing, 70.8; tail, 46.2; exposed culmen, 11; depth of bill at base, 7.6; tarsus, 14.2.

Remarks.—The three skins agree very closely among themselves and differ from true *S. spinescens* in being much larger, especially the bill.

Brachyspiza capensis peruviana (Lesson).

Four adult males, from San Miguel.

Buarremon melanocephalus Salv. and Godm.

Twenty specimens, males, females, and young in first plumage, from San Miguel, Palomina, and San Francisco.

The young are similar to the adults but the colors are all duller, the back is more olivaceous, and the under parts duller yellow, somewhat marked on the sides and chest with dusky spots.

Saltator magnus (Gmel.).

Four adults, males and females, from San Miguel and Palomina. I still doubt whether this bird is true *S. magnus*, but having no specimens from Cayenne for comparison, must let it pass as such.

Arremon schlegeli Bp.

Four adults, males and females, from Palomina and San Miguel.

Emberizoides macrurus (Gmel.).

Three specimens, an adult male from San Miguel, an adult female from Macotama, and a female in first plumage from Palomina.

These birds differ slightly from the single topotype in the National Museum collection. The edges of the primaries are much brighter yellowish olive green.

Sporophila gutturalis (Licht.).

Ten adults, males and females, from Palomina.

Pœcilothraupis melanogenys Salv. and Godm.

One adult female from Macotama, June 17, 1898.

Euphonia crassirostris Scl.

One young male from Palomina.

Calospiza desmaresti (Gray).

Twelve specimens, males, female, and young, from Palomina.

Calospiza cyanoptera (Swains.).

Twelve adults, males and females, from Palomina and San Miguel.

Ramphocelus dimidiatus Lafr.

Twenty specimens, adults of both sexes and young in first plumage. All from Palomina and San Miguel.

Tachyphonus rufus (Bodd.).

Two adults, male and female, from Palomina.

Procnias tersa occidentalis (Scl.).

Eleven specimens, adult males and females and one young just emerging from first plumage, from Palomina, San Miguel, and San Francisco.

Diglossa sittoides similis (Lafr.).

Two adults, male and female, from San Miguel.

Diglossa albilateralis Lafr.

Three adults, males and female, from San Miguel.

Diglossa nocticolor sp. nov.

Five adult males from Macotama, June.

Type, from Macotama, Colombia. No. 5610, ♂ adult, coll. of E. A. and O. Bangs. Collected June 17, 1898, by W. W. Brown, Jr. Altitude, 8000 ft.

Specific characters.—Nearest to *D. aterrima* Lafr., but differing from that species in having slate gray instead of black rump, upper tail-coverts and flanks.

Color.—Adult ♂: Black all over except rump, upper tail-coverts and flanks, which are slate gray; feet, black; bill—maxilla, black; mandible, black at tip, bluish horn-color at base; 'iris hazel.' *

Size.—Adult ♂: Length, skin, 135; wing, 76; tail, 67.4; exposed culmen, 10.8.

Remarks.—This species is readily distinguished from *D. aterrima* by its slate gray rump, tail-coverts and flanks. It is, however, probably the *D. aterrima* of Salvin and Godman (Ibis, 1880, p. 119).

Compsothlypis pitiayumi pacifica (Berl.).

Five adults, males and females, from Palomina.

Basileuterus mesochrysus Scl.

Six adults of both sexes, all taken at Palomina.

Basileuterus cinereicollis Scl.

Three adult males from San Francisco and Palomina.

Setophaga verticalis Lafr and D'Orb.

Five adults, males and females, from San Miguel.

Setophaga flavivertex Salv.

Two adults, male and female, from Macotama, June 17, 1898.

Thryothorus laetus Bangs.

Three specimens, adult male and female, and young in first plumage, from Palomina.

The adults are in rather worn plumage, but the male agrees exactly with the type of the species from Pueblo Viejo. Adult ♀, No. 5794, is not so heavily spotted on the breast and abdomen as the two males; this may be due to the abraded condition of the feathers, or may be a sexual character. The young example is very different, being altogether unspotted; above it is colored much like the adults, below it is dull rufous,

* Note by Mr. Brown from fresh specimen.

paler on center of belly, and darker on breast and sides, the throat and sides of the head are dull gray.

Henicorhina leucophrys (Tschudi).

Four adults, males and females, from San Francisco, Palomina, and San Miguel.

Catharus aurantiirostris (Hartl.).

Four adult males from Palomina.

Merula phæopyga minuscula subsp. nov.

One adult, sex undetermined, from Palomina, June 1, 1898.

Type from Pueblo Viejo, Colombia. No. 5605, ♂ adult, coll. of E. A. and O. Bangs. Collected March 23, 1898, by W. W. Brown, Jr. Altitude, 8000 ft.

Subspecific characters.—Smaller than true *M. phæopyga* of British Guiana; wing shorter; color of back and crown darker (olive in *M. phæopyga minuscula*, bistre in *M. phæopyga phæopyga*).

Size.—Type, ♂ adult: Length, skin, 183; wing, 102.4; tail, 81.2; exposed culmen, 17; tarsus, 29.

Topotype, No. 5604, ♂ adult, Length, skin, 185; wing, 103; tail, 82; exposed culmen, 16; tarsus, 27.6.

Remarks.—Although very like true *M. phæopyga*, the bird of the Santa Marta Mountains is slightly smaller and a darker more olive brown above. I no longer have any hesitation in regarding it as a fairly well marked subspecies. It is much more closely related to true *M. phæopyga* than to any of the other races of that thrush.

Mr. Brown, though in the mountains during the breeding season, took but three examples of *M. phæopyga minuscula*, and reports it a rare bird. As it is a remarkable singer, it is not likely that he passed many males unnoticed, at that season.

Merula gigas cacozela subsp. nov.

Two adults, male and female, from Macotama, June.

Type from Macotama, Colombia. No. 5685, ♀ adult, coll of E. A. and O. Bangs. Collected June 21, 1898, by W. W. Brown, Jr. Altitude 8000 ft.

Subspecific characters.—Size of true *M. gigas;* tail much shorter; colors paler, the tail in particular much lighter in color.

Color.—Upper parts, between olive and hair brown; primaries and tail the same color, but a shade darker; under parts varying from dull broccoli brown to hair brown, slightly shaded with cinnamon on abdomen; axillars, bend of wing and under primary coverts olive brown; under wing-coverts hazel, shading towards olive brown on the centers of the feathers; tarsus, foot and bill bright yellow.

Size.—Adult ♂: Length, skin, 277; wing, 144.6; tail, 135; exposed

culmen, 31; tarsus, 45.4. Adult ♀: Length, skin, 260; wing, 144; tail, 134.6; exposed culmen, 30.8; tarsus, 46.

Remarks.—When compared with Bogota specimens, which are considered typical *M. gigas*, the very short, light colored tails of the Macotama birds serve to distinguish the subspecies *cacozela*. This form is probably found throughout the Sierra Nevada de Santa Marta. Messrs. Salvin and Godman (Ibis, 1879, p. 198) record one specimen collected at San Sebastian by Simons, and notice that it differs from true *M. gigas*.

There is also a young thrush in the collection, apparently about full grown though in first plumage, taken at Palomina, May 21, 1898. I take it to be the young of my *Merula incompta*, but as Mr. Brown secured no adults of that species at Palomina, I cannot be sure. It certainly is not the young of either *M. gigas cacozela* or *M. phæopyga minuscula*.

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PROCEEDINGS

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BIOLOGIC

ON *SCIURUS VARIABILIS* FROM THE SANTA MARTA REGION OF COLOMBIA.

BY OUTRAM BANGS.

Among the mammals collected by Mr W. W. Brown, Jr., in the Santa Marta region of Colombia is a fine series of twenty-four squirrels. Twenty-one of these are from the lowlands in the immediate neighborhood of Santa Marta, at an altitude of from 500 to 600 feet, and are true *Sciurus variabilis* Geoffroy.* The other three were taken in the high sierra—one at Palomina (altitude, 5000 feet) and two at Pueblo Viejo (altitude, 8000 feet), and belong to quite a different mountain race of that squirrel.

The form from the high mountain forest of the Sierra Nevada appears to be undescribed. Its differences from true *S. variabilis* are very interesting and are exactly what would be expected from the character of its surroundings. The smaller size, much duller, deeper coloration and very much smaller audital bullæ of the new form all indicate an inhabitant of the dark, dense, saturated, luxuriant mountain forest; while the large size, long tail, vivid color and large audital bullæ of true *S. variabilis* point rather to an existence spent in the dry, open, brushy forest of the burning lowlands.

**Sciurus variabilis* was described from specimens of uncertain locality, though without doubt from Colombia, as Geoffroy tells us that the collection of which these squirrels formed a part was made in North America, the West Indies, and Colombia. It therefore seems fair to regard the specimens from the lowlands of the Colombian coast as strictly typical *Sciurus variabilis*.

Sciurus variabilis variabilis Is. Geoffroy.

Sciurus variabilis Is. Geoffroy, Mag. de Zool. I, plate iv, 1832.

Type locality.—Colombia (restricted here to the lowland forest about Santa Marta; altitude, 500–600 feet).

General characters.—Size rather large; ear high; colors vivid; skull large; audital bullæ large, much inflated, pappery; no small upper premolar.

Color.—(No. 8018, ♀ adult, from Santa Marta, 600 ft. altitude, apparently representing the normal phase of coloration). Upper parts—head, back, rump, about 90 mm. of basal portion of tail (above and below), and upper surface of legs orange-rufous, variegated with black—each hair orange-rufous, with a black median band; lower sides, shoulders, arms, a large patch above each shoulder nearly meeting on back, feet, hands, and rather more than the apical three-fourths of tail (all around) vivid, intense orange-rufous—the hairs without black bands; sides of head and chin brownish ochraceous; hairs of back and sides plumbeous at base; line of demarkation between colors of upper and under parts low down; under parts pure white to base of hairs, this color extending half way along under side of neck and in a narrow line a little way down under surface of leg and arm.

Variations in color.—The variations in color run in two opposite directions from the normal, caused (1) by the widening of the black median bands of the hairs of the upper parts, and (2) by the narrowing or total disappearance of the black bands—one 'melanism,' the other 'erythrism.'? *

The darkest individual in the series (No. 8015) has all the black bands of the hairs of back and sides, those of legs and arms also being banded, much broadened, the general tone being dusky, somewhat relieved by a few rufous-tipped hairs; the tail is as usual above, but darker below. No. 8014 has no black bands at all on the hairs of the upper parts, being a uniform fiery orange-rufous above.

Five other specimens approach either one or the other of these extremes to a greater or less degree, leaving fourteen out of twenty-one examples perfectly normal, with but a minimum of color variation. The under parts of all are clear white.

Cranial characters.—Skull normal, without small upper premolar; audital bullæ large, much inflated, thin and papery.

Size of an average old adult ♀ skull, No. 8028.—Basal length, 49.6; occipito-nasal length, 57.4; zygomatic width, 34; mastoid width, 26; interorbital width, 19.8; length of nasals, 19; length of upper tooth row, 9.6; length of mandible, 33.

(For measurements see table, p. 186.)

* See O. Thomas on color variation in *Sciurus finlaysoni,* Proc. Zool. Soc. London, 1898, p. 245.

Sciurus variabilis saltuensis subsp. nov.

Type from Pueblo Viejo, Colombia (altitude, 8000 ft). No. 8144, ♀ old adult, coll. of E. A. and O. Bangs. Collected March 26, 1898, by W. W. Brown, Jr.

Subspecific characters.—Smaller than true *S. variabilis;* tail shorter; colors duller, deeper and darker; feet and hands much darker in color; no patch of clear rufous on shoulders and sides—the hairs of this region, and also those of feet, hands and lower sides, with a black median band like the hairs of the rest of upper parts; skull smaller, and more solid; audital bullæ smaller, thicker and less inflated.

Color.—Upper parts, deep, tawny-rufous varied with black—each hair plumbeous at base, then rufous with a black median band; tail much deeper in color than that of true *S. variabilis*, the hairs of its sides with a more distinct black median band; under parts clear white to base of hairs.

Cranial characters.—Skull similar to that of true *S. variabilis* but decidedly smaller and rather more solid; audital bullæ much smaller, thicker and less inflated.

Size of type skull (old adult ♀): Basal length, 46; occipito-nasal length, 54.2; zygomatic width, 31.6; mastoid width, 24; interorbital width, 18; length of nasals, 16.4; length of upper tooth row, 9; length of mandible, 30. (For measurements see table, p. 186.)

Remarks.—Mr. Brown found this mountain representative of *S. variabilis* very rare in the several places he visited in the higher Sierra and secured but three individuals: one at Palomina, May 2, 1898; and two at Pueblo Viejo, March 20 and 26, 1898. These three skins are indistinguishable in color.

Measurements.

No.	Sex and age.	Locality.	Total length.	Tail vertebræ.	Hind foot.	Ear from notch.
		Sciurus variabilis variabilis Is. Geoffroy.				
8019	♂ old ad.	Santa Marta	500	250	53	23
8023	♀ old ad.	" "	485	245	60	27
8011	♀ old ad.	" "	482	250	57	25
8028	♀ old ad.	" "	460	235	58	25
8024	♂ old ad.	" "	467	225	55	27
8012	♂ ad.	" "	500	255	55	27
8018	♀ ad.	" "	460	230	55	26
8025	♂ ad.	" "	465	230	55	25
8022	♀ ad.	" "	470	240	56	27
8014	♂ ad.	" "	475	240	57	26
8013	♀ ad.	" "	475	240	55	26
8026	♂ ad.	" "	460	230	57	26
8030	♂ ad.	" "	450	220	53	25
8015	♂ ad.	" "	452	220	55	26
8016	♀ ad.	" "	443	215	51	27
8020	♂ ad.	" "	445	235	55	27
8010	♂ yg. ad.	" "	460	230	56	26
8017	♂ yg. ad.	" "	442	225	57	25
8027	♂ yg. ad.	" "	435	220	53	25
8021	♂ yg. ad.	" "	435	215	55	25
		Sciurus variabilis saltuensis subsp. nov.				
8144	♀ old ad.	Pueblo Viejo	420	200	54	26
8145	♂ old ad.	" "	Head & body 230		55	27
8244	♀ ad.	Palomina	410	190	52	27

Note.—'Old adult,' 'adult,' and 'young adult' are given in accordance with the appearance of the skull and teeth, regardless of the collector's measurements.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW ROCK VOLE FROM LABRADOR.

BY OUTRAM BANGS.

Early last summer Mr. Ernest Doane left Newfoundland and crossed the straits of Belle Isle to Black Bay, Labrador, where he has been collecting mammals ever since for the Bangs collection. Just before he went into winter quarters he sent one consignment of skins, including twelve examples of a rock vole which proves to be different from true *Microtus chrotorrhinus* (Miller). For the present I treat the new form as a subspecies. The rock vole has now been recorded from several pretty widely separated localities,* though it still remains one of the rarest and most desirable among the smaller mammals of northeastern North America.

The Labrador series includes four adults and eight young of various sizes, all agreeing closely in color. The new form differs from true *M. chrotorrhinus* in its paler, more yellowish gray coloring, in the larger and lighter yellow nose patches, and in sev-

* Mt. Washington (type locality—8 specimens); Profile Lake, N. H. (1 specimen), and Trowser's Lake, N. B. (1 specimen)—Miller, *Proc. Bost. Soc. Nat. Hist., Mar. 24, 1894, pp. 190-193;* Trowser's Lake (3 additional specimens) and Gulquac Lake, N. B. (1 specimen)—Allen, *Bull. Am. Mus. Nat. Hist., 1894, p. 360;* Lake Edward, Quebec (9 specimens)—Bangs, *Proc. Biol. Soc. Wash., X, Mar. 9, 1896, p. 49;* Breed's, Essex Co., N. Y. (27 specimens), and above Profile Lake, N. H. (1 specimen)—Batchelder, *Proc. Bost. Soc. Nat. Hist., Oct., 1896, pp. 188, 189;* Hunter Mountain, Catskills, N. Y. (1 specimen)—Mearns, *Proc. U. S. Nat. Mus., 1898, p. 349.*

eral well-marked and constant cranial and dental characters. It may be known as—

Microtus chrotorrhinus ravus* subsp. nov.

Type from Black Bay, Labrador, ♂ old adult, No. 7951, coll. of E. A. and O. Bangs. Collected July 15, 1898, by Ernest Doane.

Color and pelage.—Fur longer, softer, and more like Phenacomys than in *M. chrotorrhinus chrotorrhinus;* all the colors paler; upper parts pale grayish raw umber, somewhat darkened on back by a sprinkling of black-tipped hairs; nose and face back to eyes pale tawny ochraceous, this color suffusing much of head, especially about the ears; under parts gray, extending well up on sides and gradually blending with color of upper parts; feet and hands gray; tail dusky brown above, paler and grayer below, sparsely haired; whiskers black and yellowish white mixed.

Cranial and dental characters.—The skull, compared with that of true *M. chrotorrhinus*, is much more slender and more constricted between the orbits; rostrum more slender; incisive foramina longer; audital bullæ flatter, less inflated, more oblong, and less round. Pattern of enamel folding of molar teeth substantially the same; molars all much smaller and more delicate; incisors more slender.

Measurements.—The type, ♂ old adult; total length, 170; tail vertebræ, 50; hind foot, 22; ear from notch, 14. Averages of four adult topotypes, of both sexes: total length, 159.75; tail vertebræ, 46; hind foot, 21.25;† ear from notch, 12.5. Skull (type, ♂ old adult)—basal length, 24.8; occipito-nasal length, 26.6; zygomatic width, 15; mastoid width, 11.6; width between orbits, 3.6; length of nasals, 7.4; length of upper tooth row, 6; length of mandible, 16.4.

Remarks.—I find it very hard to express the differences in color between true *M. chrotorrhinus* and *M. c. ravus*, though they are evident enough when series of the two forms are laid side by side. Young examples show the differences in color quite as well as do adults.

Without a complete series from connecting localities, it seems better to regard *ravus* merely as a subspecies of *chrotorrhinus*, although the rock voles from Lake Edward, Quebec, are in every way inseparable from true *chrotorrhinus* from the type locality—Mount Washington, N. H.—and show no approach to the form of the coast of middle Labrador.

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* Ravus = gray-yellow.

† The collector's measurements for foot run larger in *M. c. ravus* than in true *M. chrotorrhinus*. I can, however, detect no appreciable difference in the dried skins.

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PROCEEDINGS

OF THE

BIOLOGICAL SOCIETY OF WASHINGTON

A NEW *SIGMODON* FROM THE SANTA MARTA REGION OF COLOMBIA.

BY OUTRAM BANGS.

The collection of mammals made by W. W. Brown, Jr., in the Sierra Nevada de Santa Marta contains but three examples of *Sigmodon*. Two of these are adult males and practically alike: one taken at Pueblo Viejo, at an altitude of 8000 feet, on March 23, 1898; the other at Palomina, 5000 feet, June 21, 1898. The third specimen is an adult female from Pueblo Viejo. It is so much smaller than the two males and differs so much otherwise, that without more material I hesitate to refer it to the same species. I have therefore left it out of consideration and based my description wholly upon the two males.

The new form is closely related to both *S. borucæ* Allen, from Costa Rica, and *S. bogotensis* Allen from Bogota, differing from the former principally in harsher pelage and much more hairy tail, and from the latter in much paler coloration. It may be known as

Sigmodon sanctæmartæ sp. nov.

Type from Pueblo Viejo,* Colombia. No. 8105, ♂ adult, coll. of E. A. and O. Bangs. Collected Mar. 23, 1898, by W. W. Brown, Jr. Altitude, 8000 feet.

General characters.—Pelage long, full, hispid; tail very hairy; color above, dull tawny-ochraceous, lined with blackish; ear rather large, sparsely

* There are at least three towns in Colombia called Pueblo Viejo. The one at which Mr. Brown collected is in the center of the Sierra Nevada, not far from the source of Rio Ancho.

haired on outside; skull with wide nasals and large, wide, incisive foramina (teeth too worn to show characters well), otherwise not differing much from the skull of the type species, *S. hispidus*.

Color.—Upper parts dull tawny-ochraceous, becoming darker and more russet on rump, and lined with blackish tipped hairs, which are most numerous along back; hairs plumbeous at base, except a few sprinkled over back and sides, which are yellowish-white throughout their entire length;* nose and cheeks wood brown; under parts dull wood brown to whitish, the plumbeous under fur showing through; upper surface of feet and hands dark gray; tail very hairy, dusky above, dull grayish below.

Measurements.—Type, total length, 282; tail vertebræ, 115; hind foot, 32; ear from notch, 20. No. 8250, ♂ adult, from Palomina: total length, 290; tail vertebræ, 120; hind foot, 30; ear from notch, 17.

Skull, type, basal length, 32; occipitonasal length, 36.4; zygomatic width, 19.2; mastoid width, 14; interorbital width, 5.6; length of nasals, 13.2; breadth of nasals, 4.2.

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* This character is shown equally by both specimens, and gives a peculiar grayish cast to the fur.

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